

ENGINEERING EXHIBITS  
IN SUPPORT OF COMMENTS OF  
THE AM RADIO PRESERVATION ALLIANCE  
IN MB DOCKET NO. 13-249

KWKH(AM), Shreveport, Louisiana

JANUARY 2019

The attached engineering exhibits have been prepared on behalf of the AM Radio Preservation Alliance (AMRPA) to document the impact on AM radio service during nighttime, critical hours and daytime operations, respectively, if certain changes to the AM protection rules currently enforced by the Federal Communication Commission (FCC), under consideration in MB Docket No. 13-249, were adopted.<sup>1</sup> These exhibits clearly validate that there would be minimal theoretical gains in radio service provided by other AM stations at the expense of new interference to vastly more populations currently reached by established Class A AM radio service.

In this set of engineering exhibits, interference and coverage studies were conducted analyzing Class A AM Station KWKH, Shreveport, Louisiana, FCC Facility ID No. 60266, in regard to its nighttime (Figures 1-N through 11-N), critical hours (Figures 1.1-C through 2.3-C) and daytime operations (Figures 1-D through 5-D), applying the FCC's reduced protection requirements to Class A AM stations as proposed in the *SFNPRM*.<sup>2</sup>

As detailed further below, Figure 1-N documents the negative impact on the studied Class A AM station's nighttime signal from nearby non-Class A AM stations adding nighttime coverage assuming the *SFNPRM*'s Alternative 1 for nighttime hours protection to Class A AM stations (protection of 0.5 mV/m groundwave contour) was adopted, while Figures 2-N through 11-N show the theoretical additional service if neighboring non-Class A AM stations were to add nighttime coverage under Nighttime

---

<sup>1</sup> See *Revitalization of the AM Radio Service*, Second Further Notice of Proposed Rulemaking, FCC 18-139, MB Docket No. 13-249 (rel. Oct. 5, 2018) ("*SFNPRM*").

<sup>2</sup> These interference studies were conducted using computer software V-Soft AMpro2's incoming interference study program, combining interfering signal strength using the RSS methodology with a 50% minimum level for inclusion and a buffer grid size of 500x500.

Alternative 1.<sup>3</sup> Following these figures are contour maps (prepared by iHeartMedia's engineering staff) mapping these non-Class A AM station's theoretical nighttime AM gain areas in comparison with such station's licensed or permitted FM translator service area (60 dBu contour), where applicable,<sup>4</sup> along with a chart summarizing the actual FM translator population served in contrast to the theoretical nighttime AM gains coming at the expense of more interference on the AM band.

Figures 1.1-C, 1.2-C and 1.3-C address the studied Class A AM station during critical hours periods under Alternative 1 (Class A AM stations afforded no protection from other AM stations during critical hours). Figures 2.1-C, 2.2-C and 2.3-C document the studied Class A AM station during critical hours periods under Alternative 2 of the *SFNPRM* (protection of a Class A AM station during critical hours only to its 0.5 mV/m groundwave contour by amending 47 C.F.R. Section 73.190 critical hours figures to reference the distance from the Class A AM station's 0.5 mV/m contour in lieu of its 0.1 mV/m contour). These Critical Hours Alternative 1 and Alternative 2 studies reflect increasing interference (shaded red) to currently served populations by the studied Class A AM station at the intervals of one-hour, one-half hour, and one-quarter hour before sunset.

Daytime operations under the *SFNPRM* proposal are addressed in Figures 1-D through 5-D. Figure 1-D documents the daytime operations of the studied Class A AM station as currently protected (to its 0.1 mV/m daytime groundwave contour), as well

---

<sup>3</sup> Based on a sampling analysis, *SFNPRM* Nighttime Alternative 2 generally is expected to authorize even more interference to the listeners of Class A AM stations than pursuant to *SFNPRM* Nighttime Alternative 1.

<sup>4</sup> In situations where the non-Class A AM station has more than one FM translator authorization, only the FM translator facility closest to the theoretical nighttime AM gain area has been mapped.

as the predicted interference within that contour that would result if nearby AM stations operated with the maximum powers permitted in the direction of the studied Class A AM station as proposed in the *SFNPRM* (protecting only the 0.5 mV/m daytime groundwave contour of the Class A AM station). Figures 2-D through 5-D document the potential daytime population gain – solely in the direction of the studied Class A AM station as other stations may limit power gains in other directions – for the individual interfering stations, assuming the daytime protection to only the 0.5 mV/m groundwave contour was adopted as proposed in the *SFNPRM*.

Following the Figures are charts tabulating the results of these nighttime, critical hours and daytime studies.

In addition, the summary pages of the “Grid Based Incoming Interference Population Report(s)” conducted for the nighttime, critical hours and daytime analysis of the studied Class A AM station are also attached. Due to their length, only the summaries, and not the entire Grid Based Incoming Interference Population Report(s) are attached; the entire Report(s) are available upon the request of the FCC or any interested party.

Below is a summary of the methodology of the conducted coverage and interference studies in regard to the studied Class A AM station as documented in the attached figures and charts:

#### Nighttime

Figure 1-N maps the studied Class A AM station’s nighttime 0.5 mV/m 50% skywave contour (red line), which is currently protected, along with the Class A AM station’s nighttime 0.5 mV/m groundwave contour (blue line) which is proposed to be protected under Nighttime Alternative 1 of the *SFNPRM*. The resulting zone subject to new interference from co-channel Class D stations adding nighttime operations is shown in

red shading, and the currently-served population and population subject to such new interference are detailed in red on Figure 1-N. In determining the interference to the studied Class A AM station, the nighttime operation for each impinging Class D AM station is based on protecting the 0.5 mV/m groundwave contour of the studied Class A AM station pursuant to Nighttime Alternative 1 of the *SFNPRM*. Generally, the impinging Class D AM stations are non-directional. In those few instances where the Class D AM station employs a directional pattern, the presumed Class D AM station power has been limited in the direction of the studied Class A AM station's 0.5 mV/m groundwave contour and has not been verified for protection limits in other directions.

Figures 2-N through 11-N show the nighttime interference-free contour for each co-channel Class D interfering AM station assuming nighttime operations with maximum permissible power, while protecting only the nighttime 0.5 mV/m groundwave contour of the studied Class A AM station pursuant to Nighttime Alternative 1 of the *SFNPRM*. The potential nighttime population and area gains resulting from such co-channel Class D stations operating with maximum allowed power in the direction of the studied Class A AM station's protected 0.5 mV/m groundwave contour is also detailed in red on each figure. A tabulation of the nighttime study results is provided following all the figures.

### Critical Hours

Figures 1.1-C through 1.3-C and Figures 2.1-C through 2.3-C each show the daytime 0.1 mV/m groundwave contour (blue line) and the 0.5 mV/m groundwave contour (red line) of the studied Class A AM station. There are three studies in each set, employing skywave diurnal factors (FCC Section 73.190 Figure 13) for the time frames of (i) one hour prior to sunset (SS-1), (ii) ½ hour prior to sunset (SS-0.5), and (iii) ¼ hour prior to sunset (SS-0.25). Predicted interference within the respective contours is shown in red shading.

Under Critical Hours Alternative 1 of the *SFNPRM*, neighboring stations to a Class A AM station (which in this instance are Class D stations) could continue to operate at full daytime power during critical hours. The interference to the studied Class A AM station from such unrestricted power operations of its neighbors during critical hours per Alternative 1 of the *SFNPRM* is documented in red shading on Figures 1.1-C, 1.2-C and 1.3-C, for each respective time period (one hour, ½ hour and ¼ hour prior to sunset).

Pursuant to Critical Hours Alternative 2 of the *SFNPRM*, the Commission would change the vertical axis reference for application of Figures 9, 10 and 11 of 47 C.F.R. Section 73.190 from "Distance from 0.1 mV/m Contour in Miles" to "Distance from 0.5 mV/m Contour in Miles." The interference to the studied Class A AM station from such revised permissible power calculations for its neighbors during critical hours per Alternative 2 of the *SFNPRM* is documented in red shading on Figures 2.1-C, 2.2-C and 2.3-C, for each respective time period (one hour, ½ hour and ¼ hour prior to sunset).

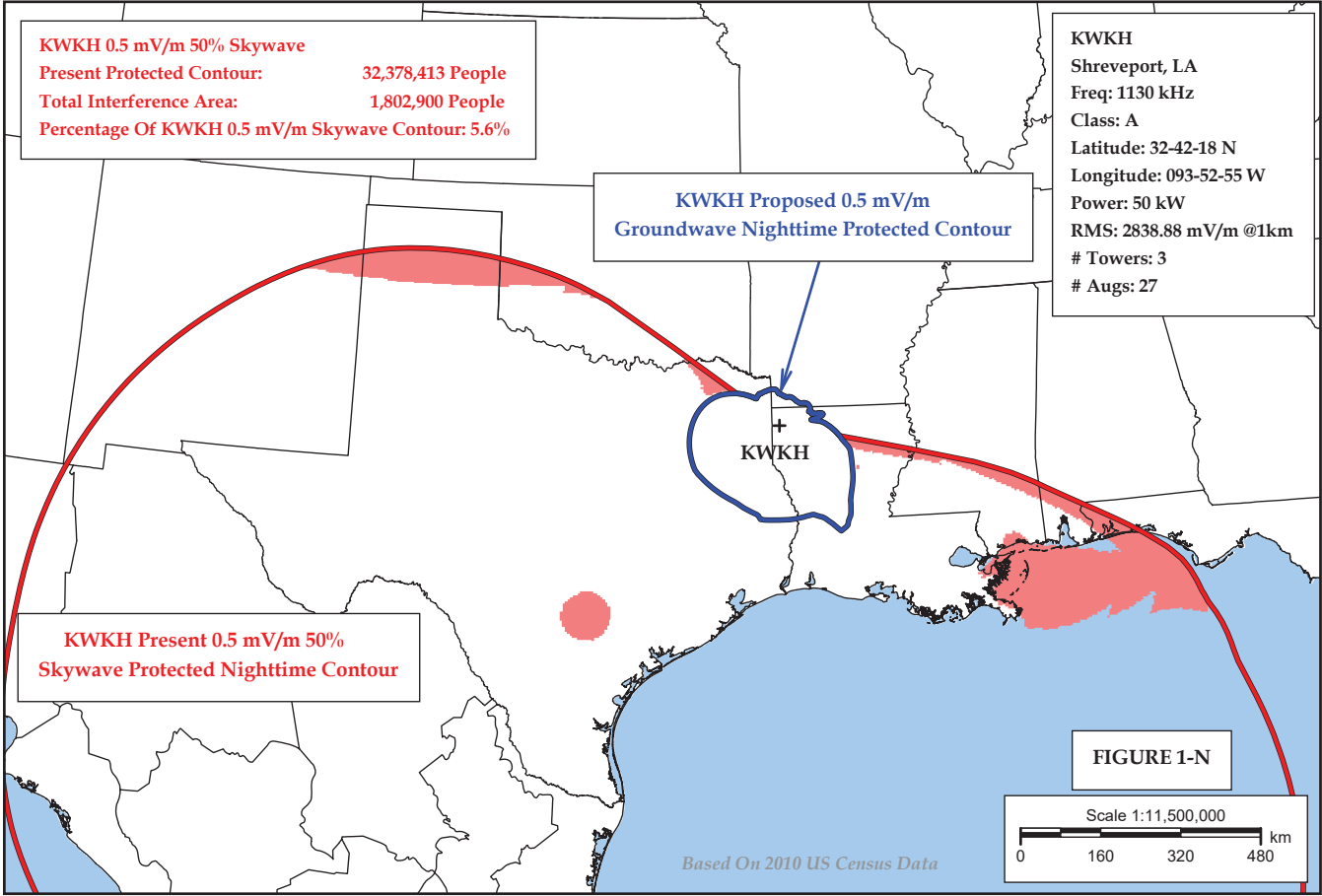
The box on the upper left-hand corner of each Critical Hours figure sets forth the data for the population, area and percentage impact of the resulting interference under the reviewed Critical Hours Alternative on the studied Class A AM station's 0.1 mV/m contour; the box on the upper right-hand corner, on the studied Class A AM station's 0.5 mV/m contour. A tabulation of the critical hours study results is provided following all the figures.

### Daytime

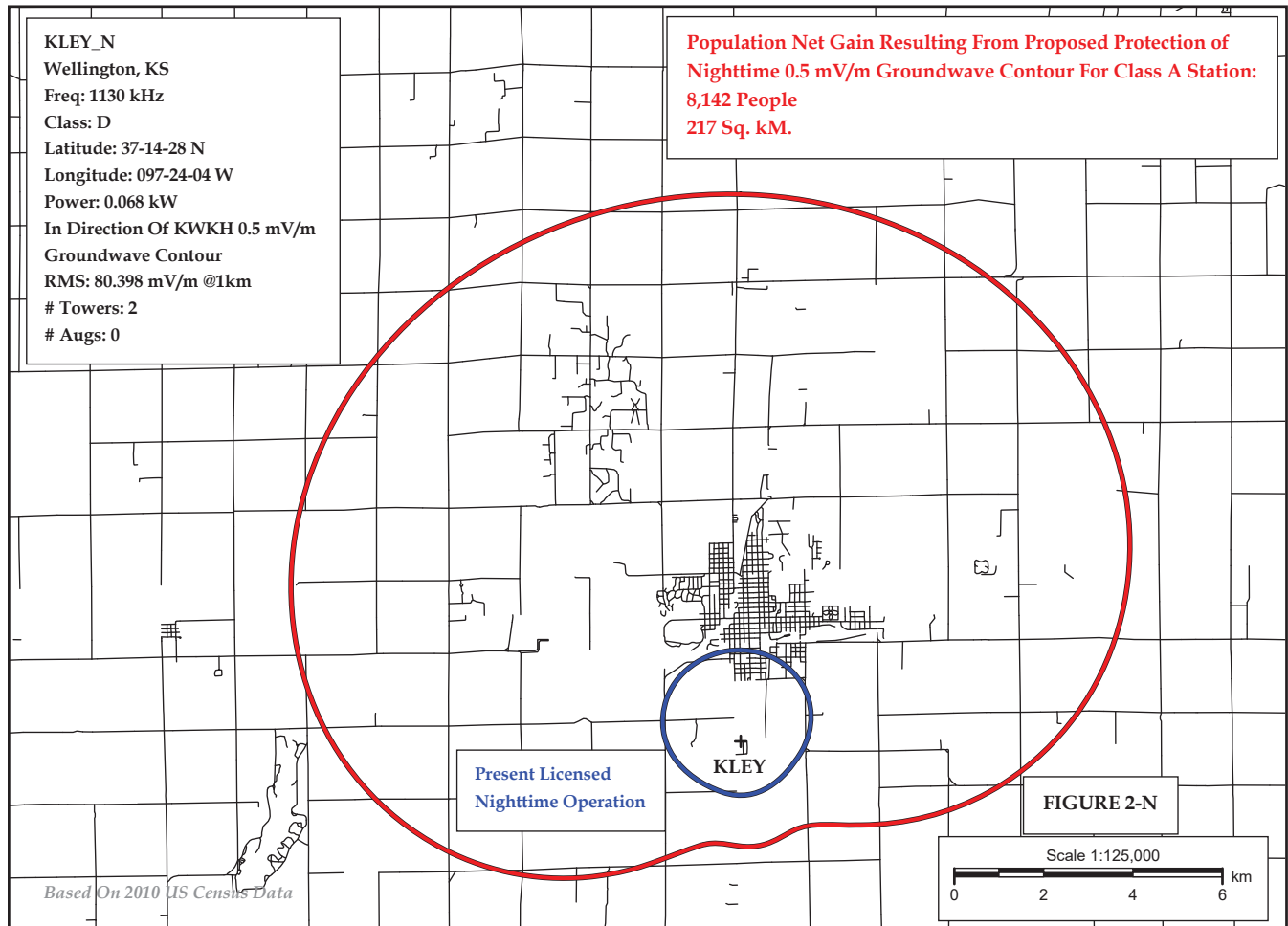
For the studied Class A AM station, Figure 1-D maps the present daytime protected 0.1 mV/m groundwave contour (blue line) as well as the less-encompassing daytime 0.5 mV/m groundwave contour (red line) proposed to be protected from co-channel interference in the *SFNPRM*. The interference area resulting from nearby co-channel stations (typically Class D AM stations) operating with maximum potential power (up to 50 kW) in the direction of the studied Class A AM daytime 0.5 mV/m groundwave contour is shown in red shading. The box at the upper right-hand corner of Figure 1-D details the currently protected population within the studied Class A AM station's daytime 0.1 mV/m groundwave contour, the population within that contour that would be subject to interference if only the daytime 0.5 mV/m groundwave contour is protected as proposed in the *SFNPRM*, and the percentage of the current population now served that such interference zone encompasses.

Figures 2-D through 5-D document the potential daytime population gain for the individual interfering stations in the direction of the studied Class A AM station with daytime protection to the Class A AM station's 0.5 mV/m groundwave contour, as proposed in the *SFNPRM*. The boundaries for the gain areas are the difference between the licensed and potential 0.5 mV/m groundwave contours of the interfering station through the arc of the Class A AM station's protected 0.5 mV/m groundwave contour, as detailed on each of Figures 2-D through 5-D. Individually and collectively, the potential daytime population gains by the interfering stations in the direction of the now-limiting Class A AM station under the *SFNPRM* daytime proposal constitutes a tiny percentage of the population that would be subject to new interference to their daytime reception of the studied Class A AM station. A tabulation of the daytime study results is provided following all the figures.

SMITH KHANNA & GULL, Inc. - Consulting Engineers

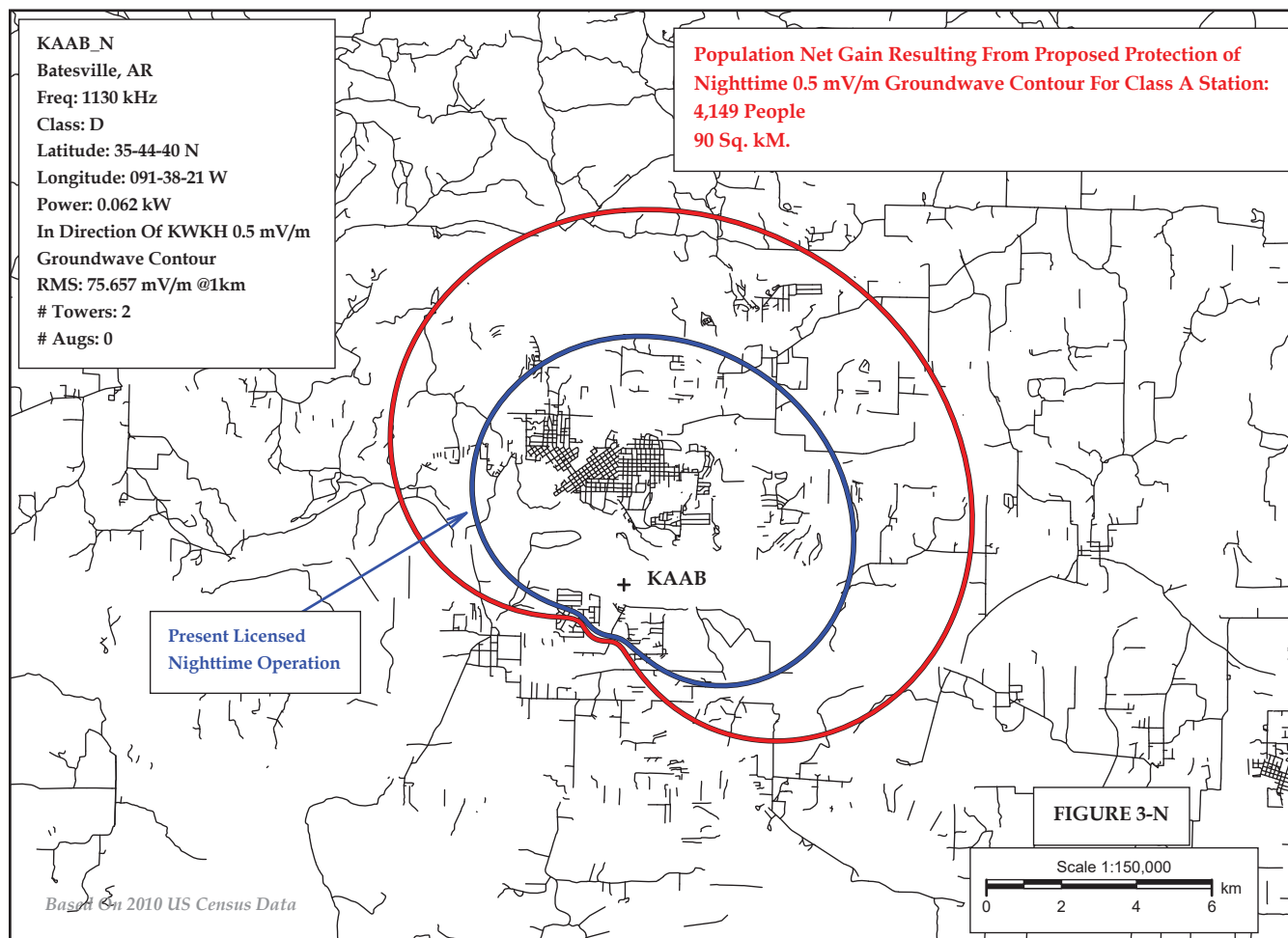


Predicted Nighttime Interference Area To The Present Protected KWKH 0.5 mV/m 50% Skywave Nighttime Contour From Class D Stations KLEY, KAAB, WLBA, WYXE, WBZB, WQFX, KILJ, WALQ, KTMR And WAMB Operating With Maximum Allowed Power In The Direction Of KWKH's 0.5 mV/m Groundwave Contour

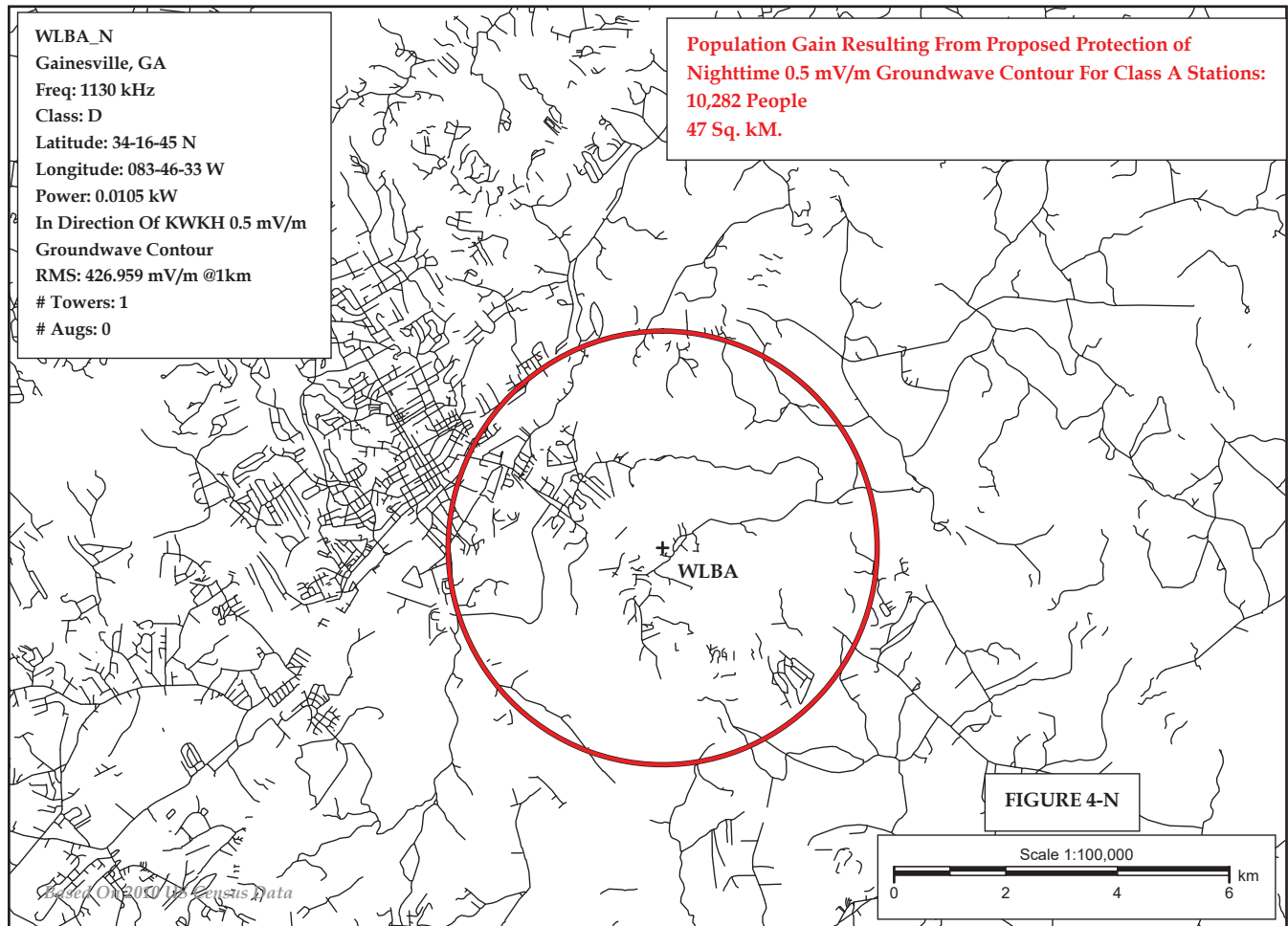


KLEY NIF 8.8 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour

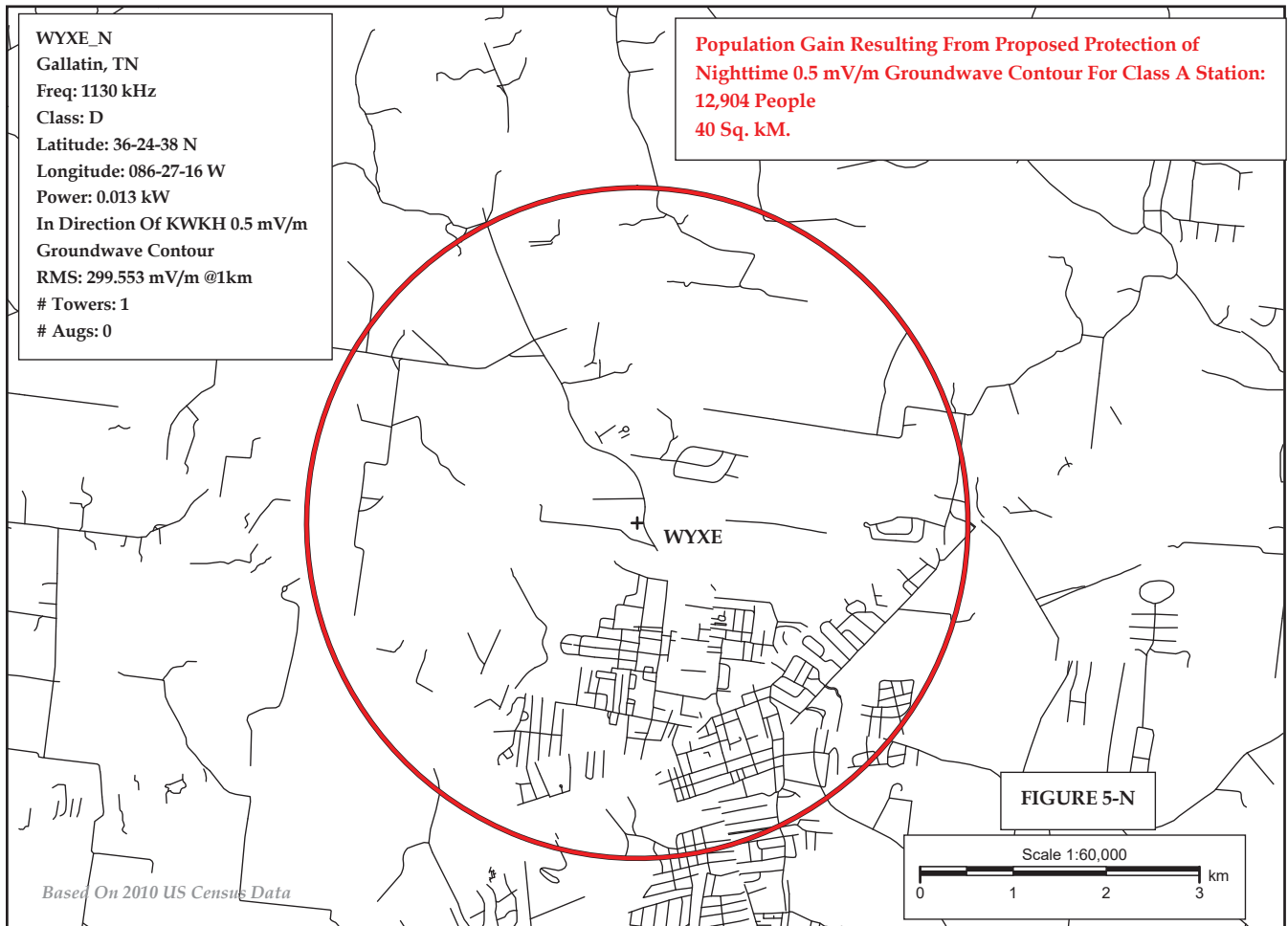




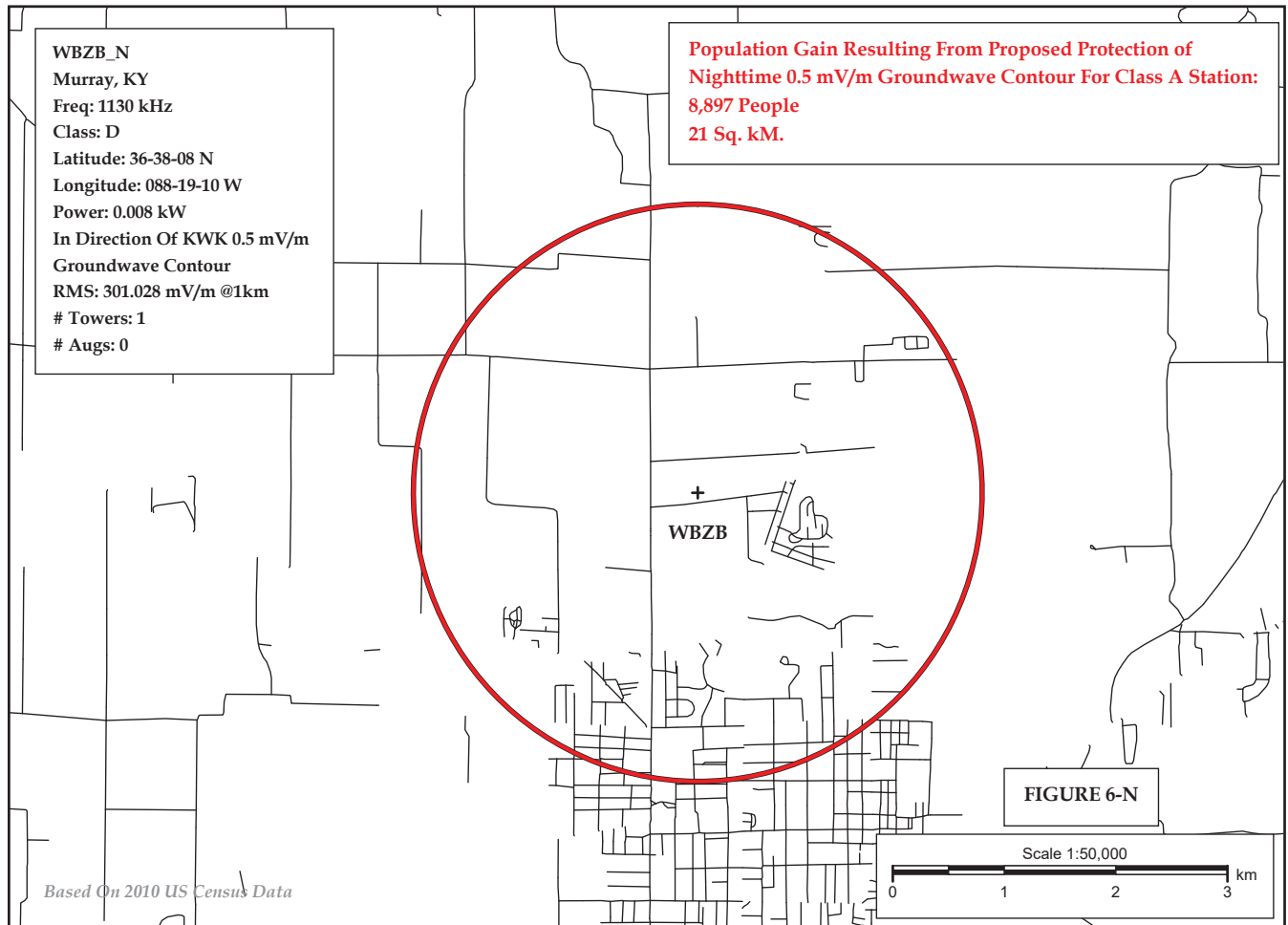
KAAB NIF 7.2 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



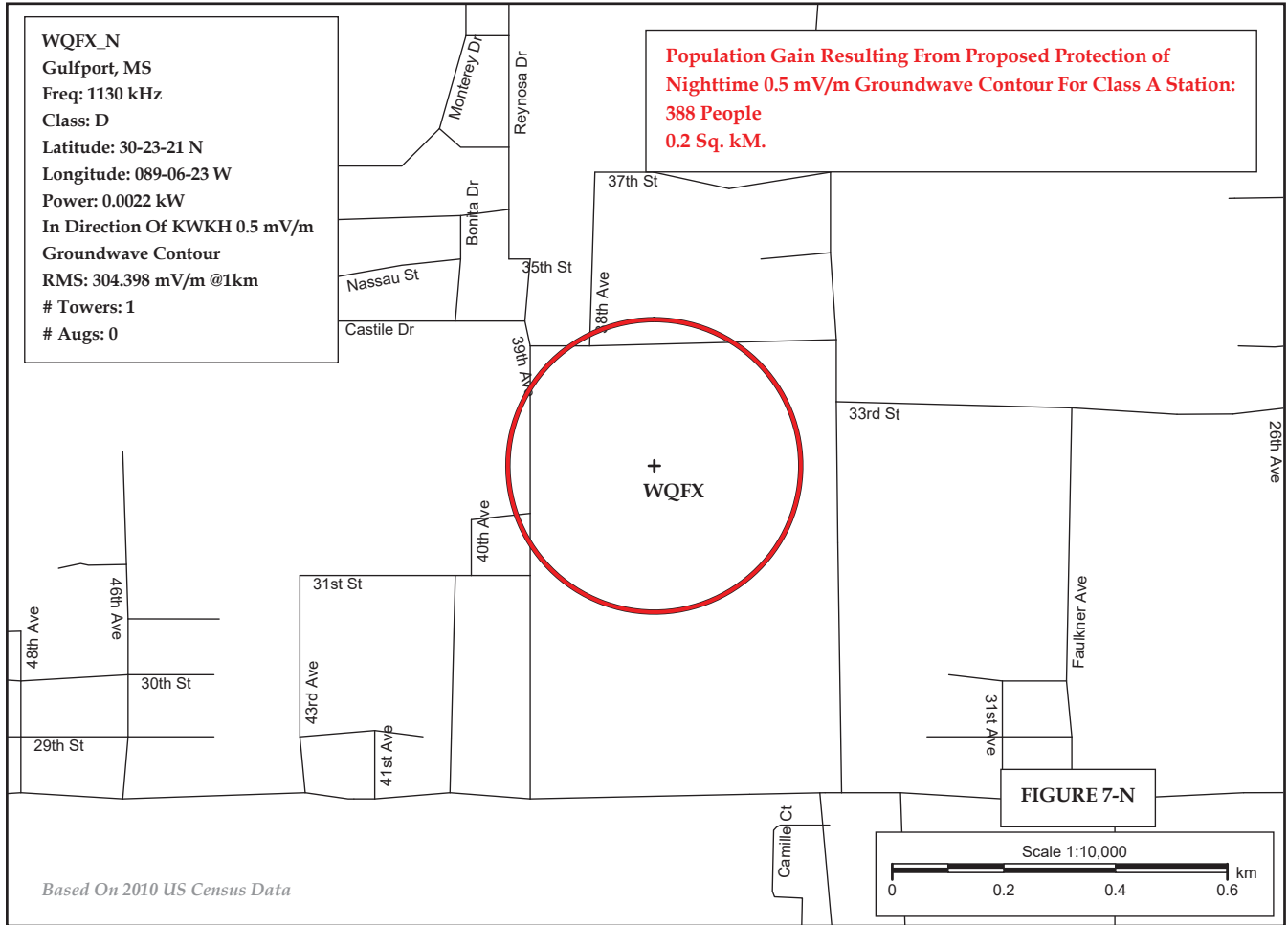
WLBA NIF 4.7 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



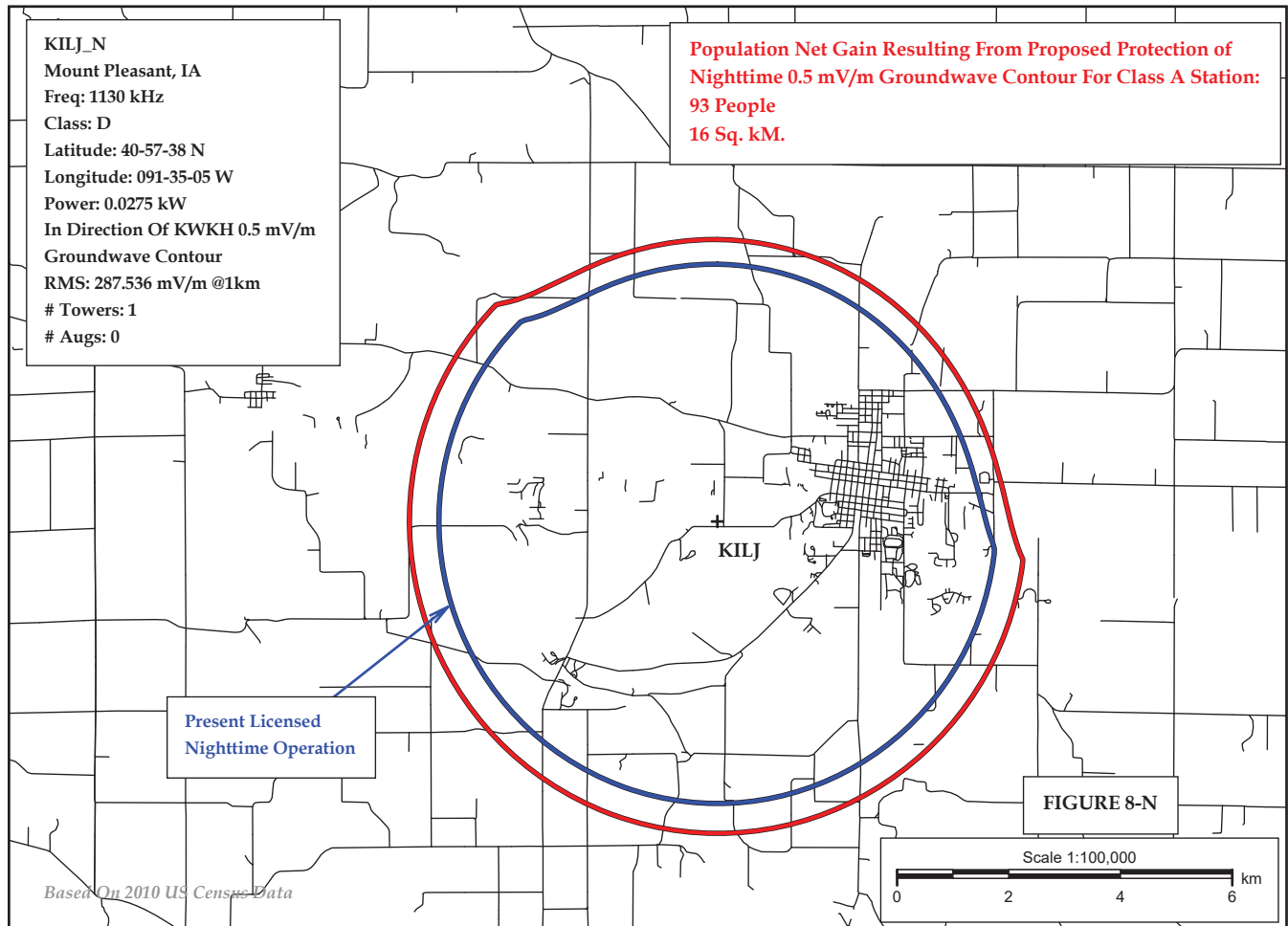
**WYXE NIF 6.2 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour**



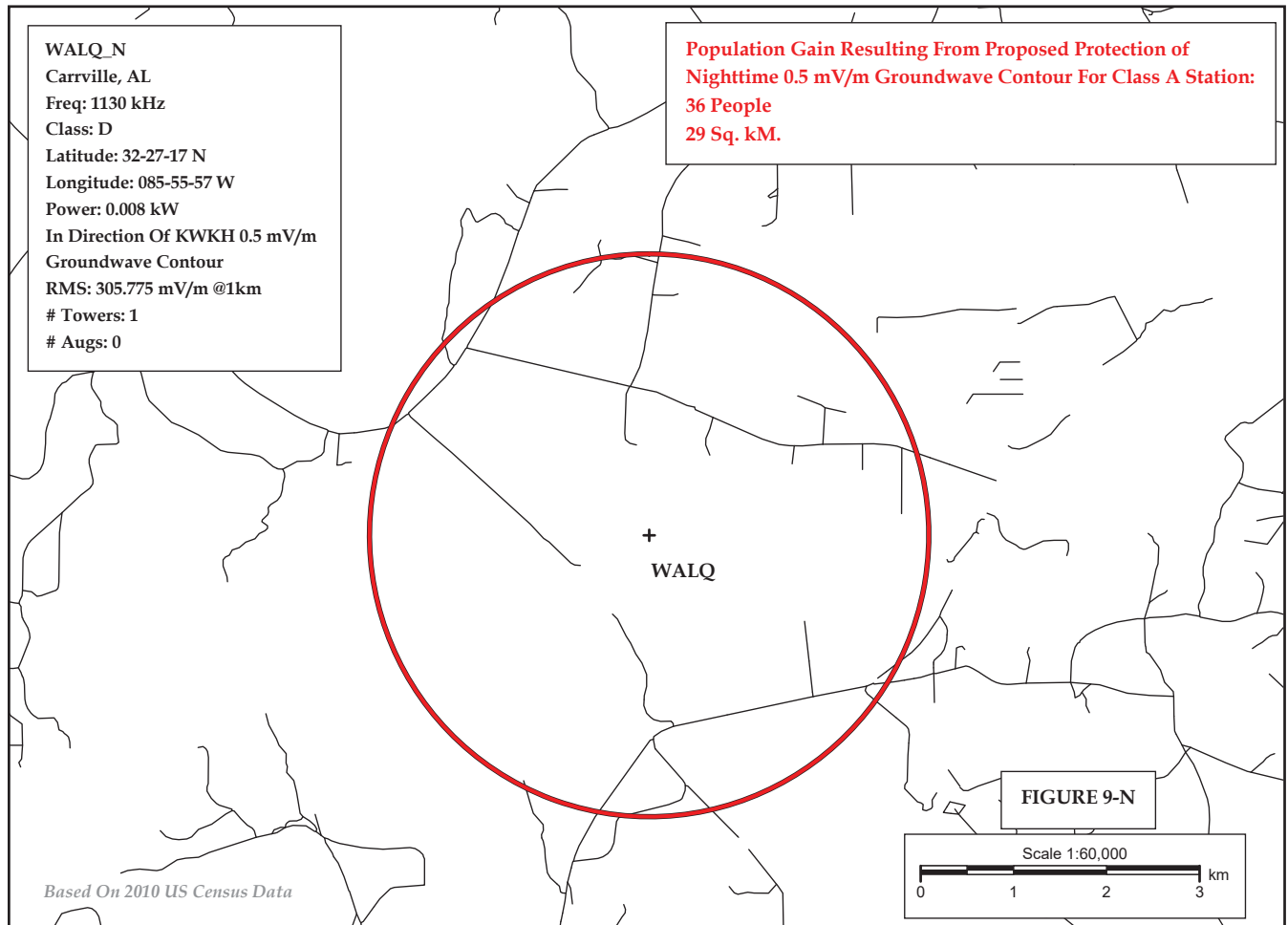
WBZB NIF 7.5 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



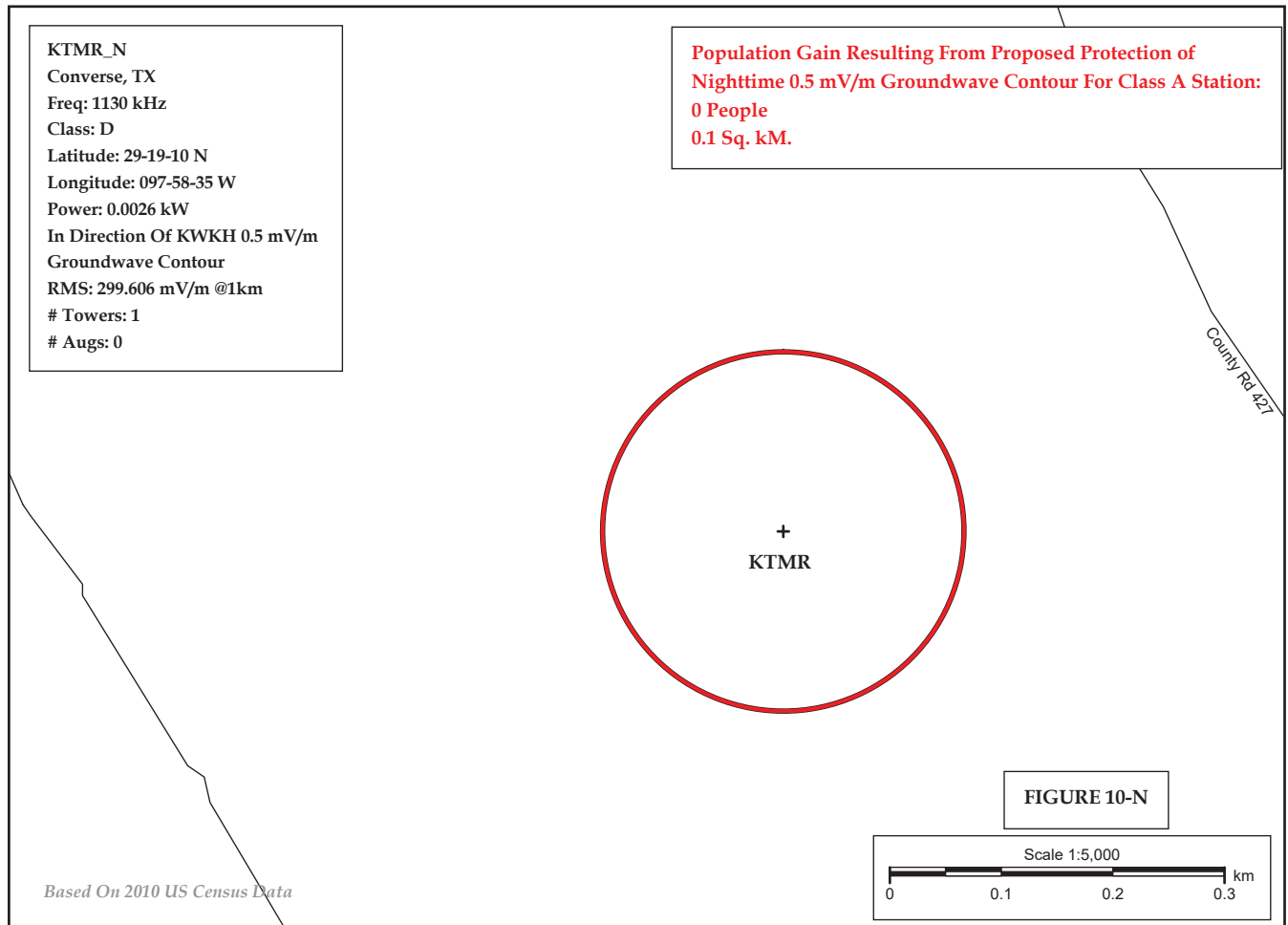
WQFX NIF 46.7 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



KILJ NIF 7.4 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour

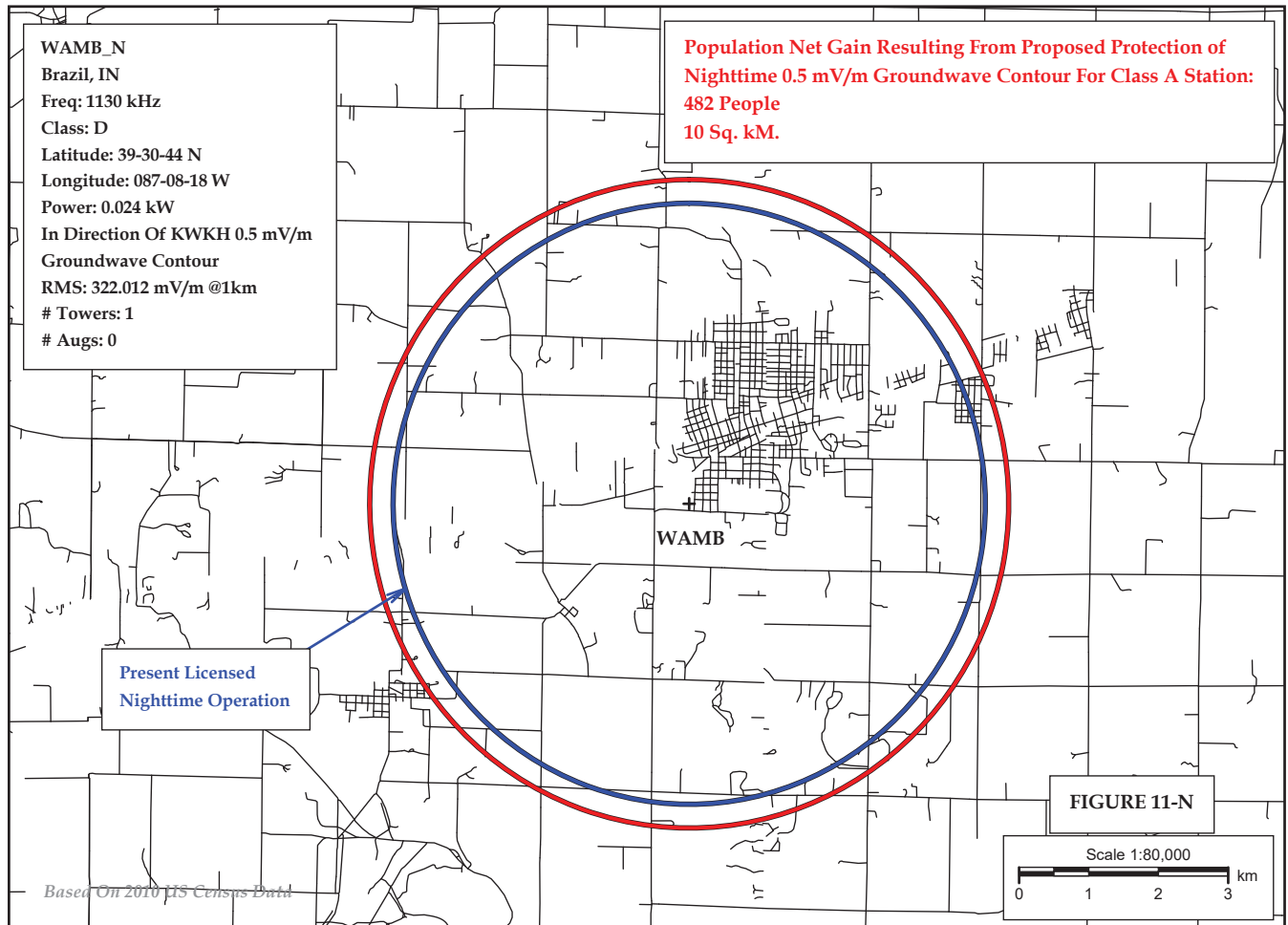


WALQ NIF 6.2 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour



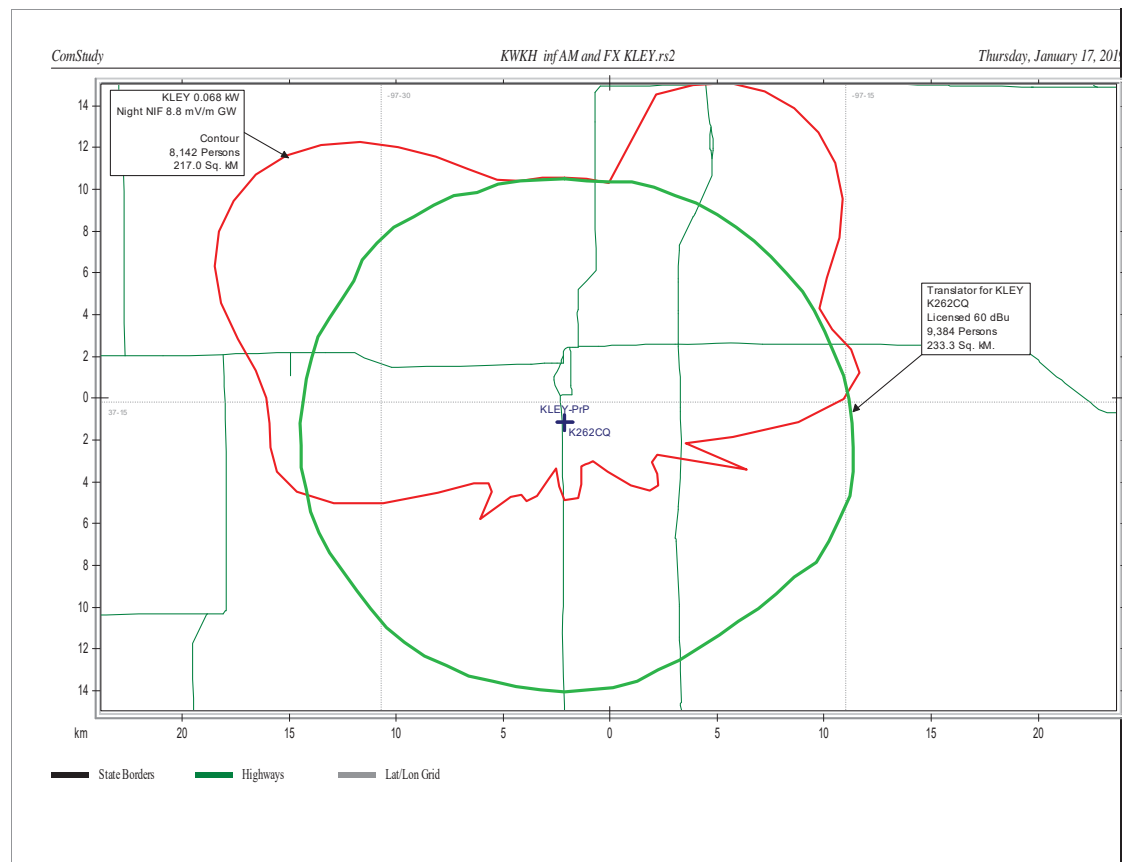
KTMR NIF 94 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour





WAMB NIF 8.4 mV/m Groundwave Contour With Protection To Class A Station KWKH's Proposed Protected 0.5 mV/m Groundwave Nighttime Contour

KLEY



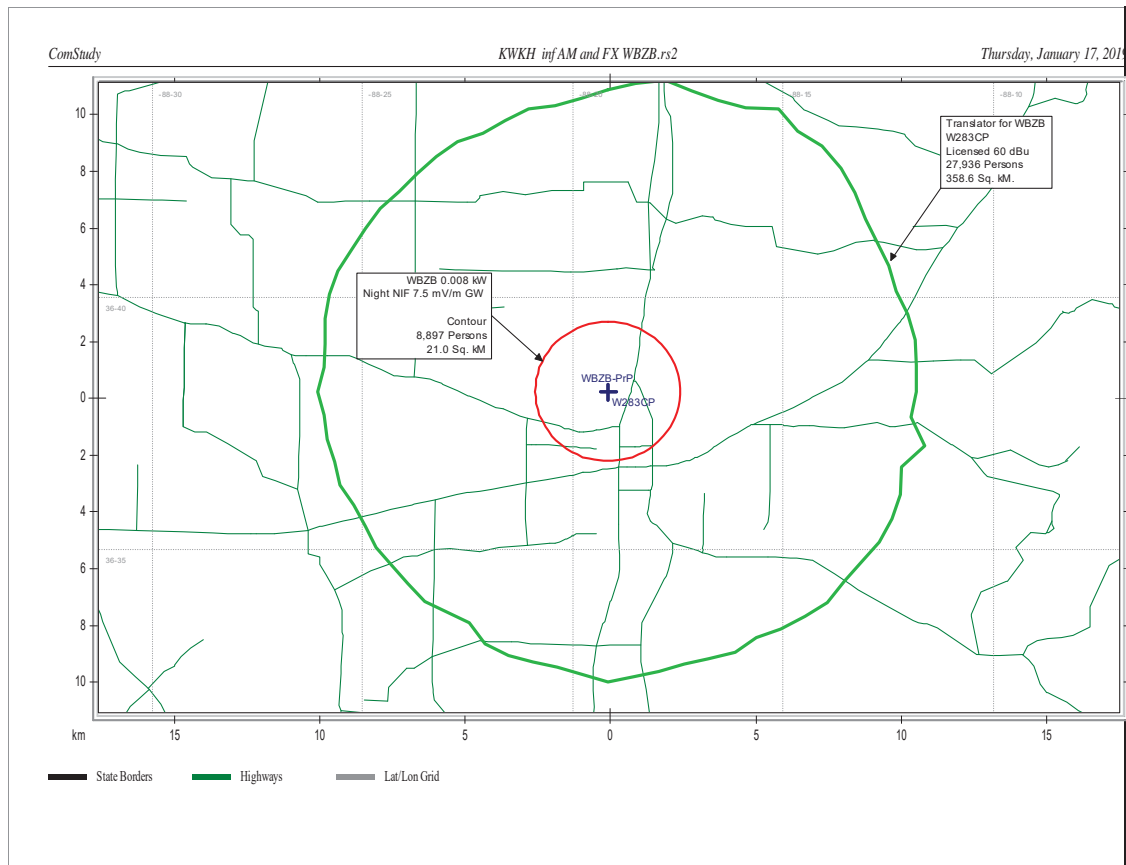
No FM Translators:

KAAB

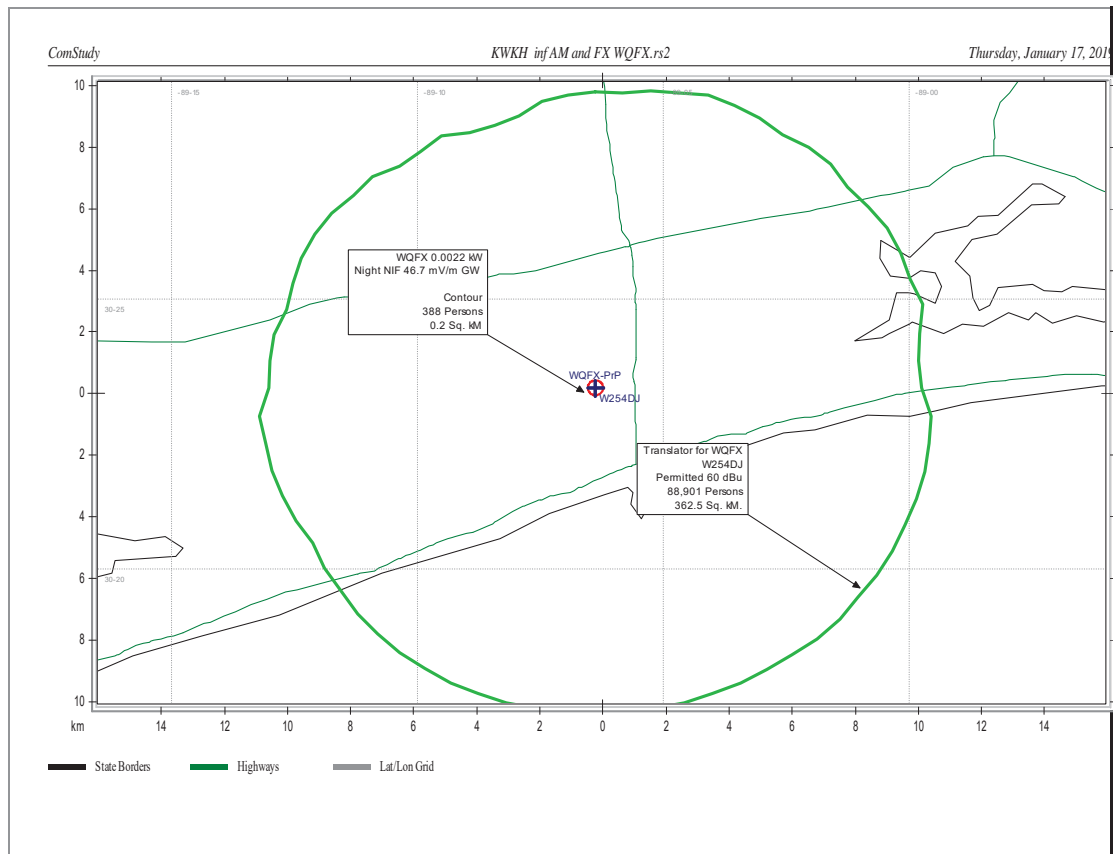
WLBA

WYXE

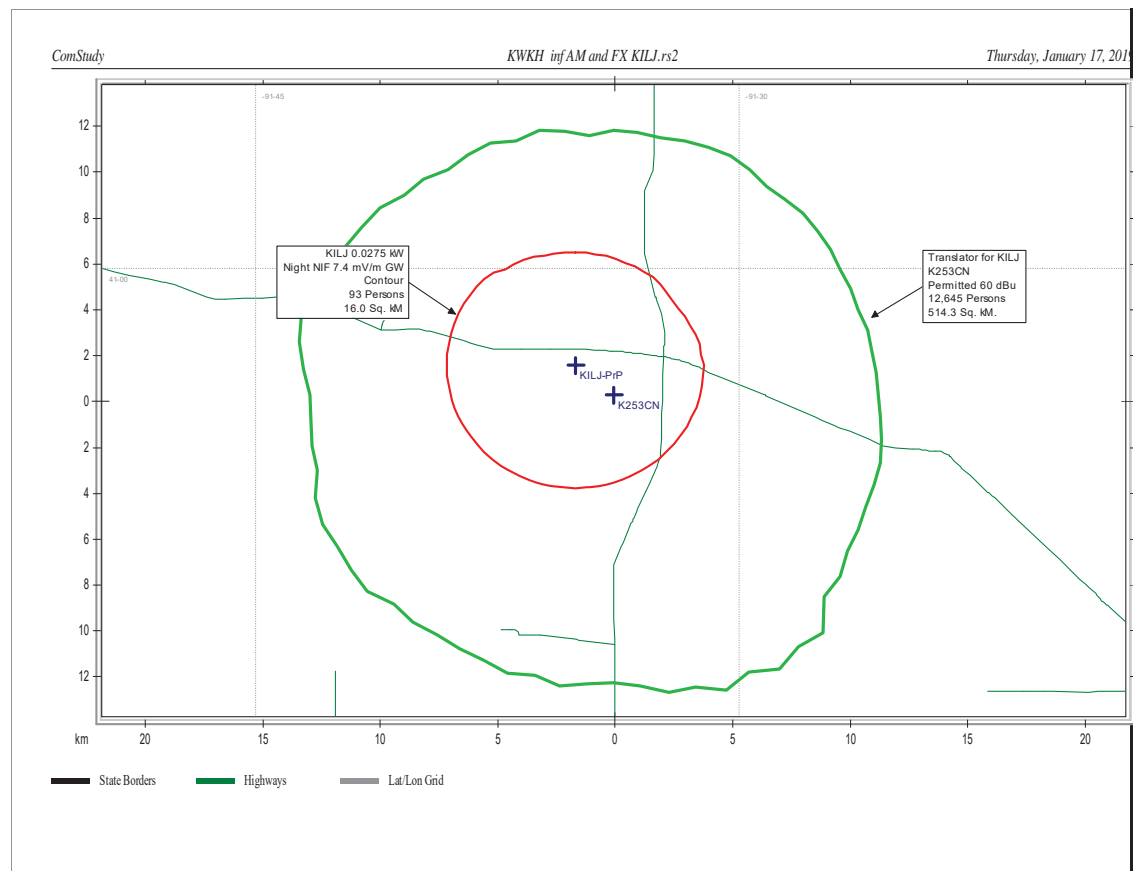
## WBZB



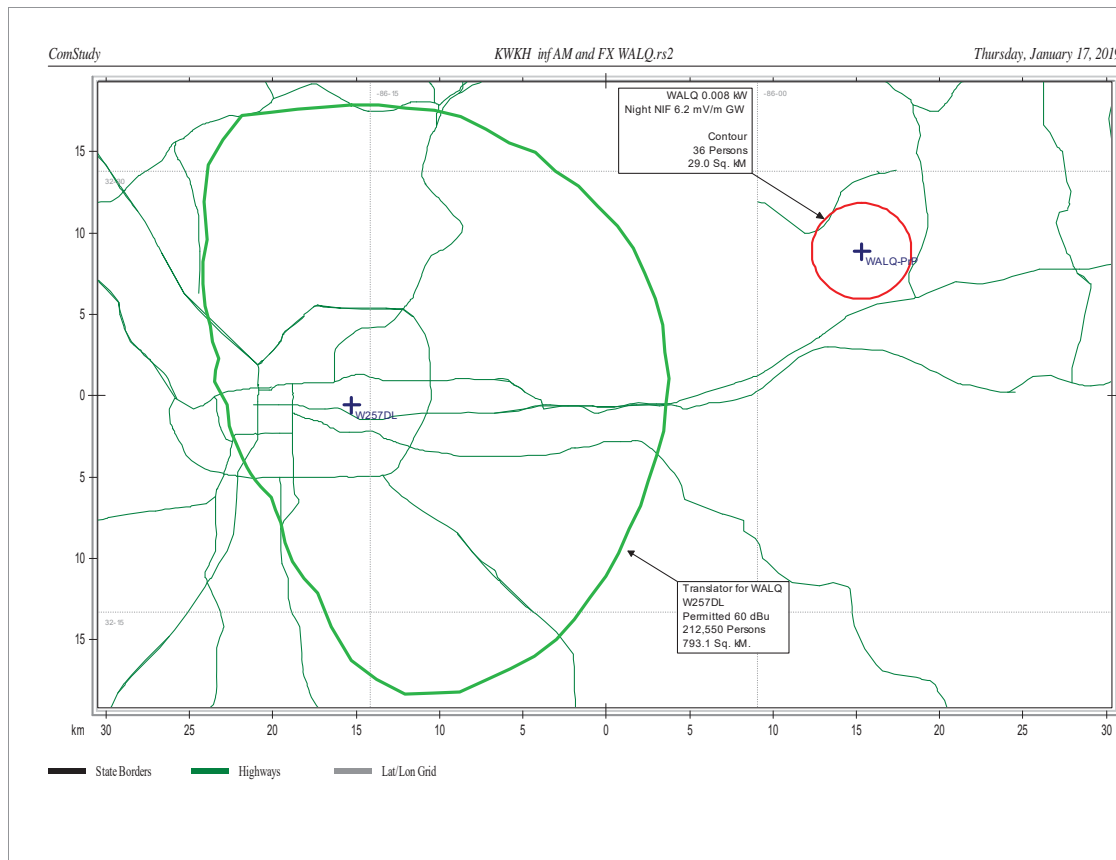
## WQFX



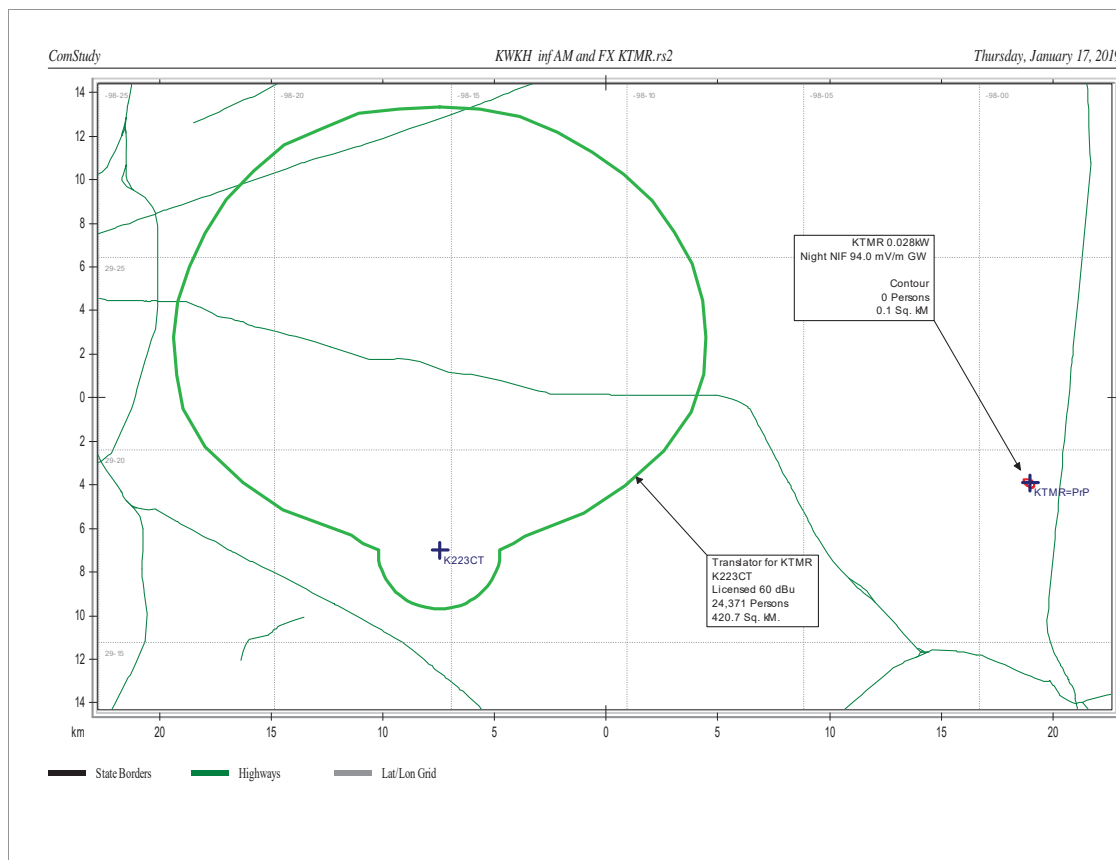
KILJ



WALQ

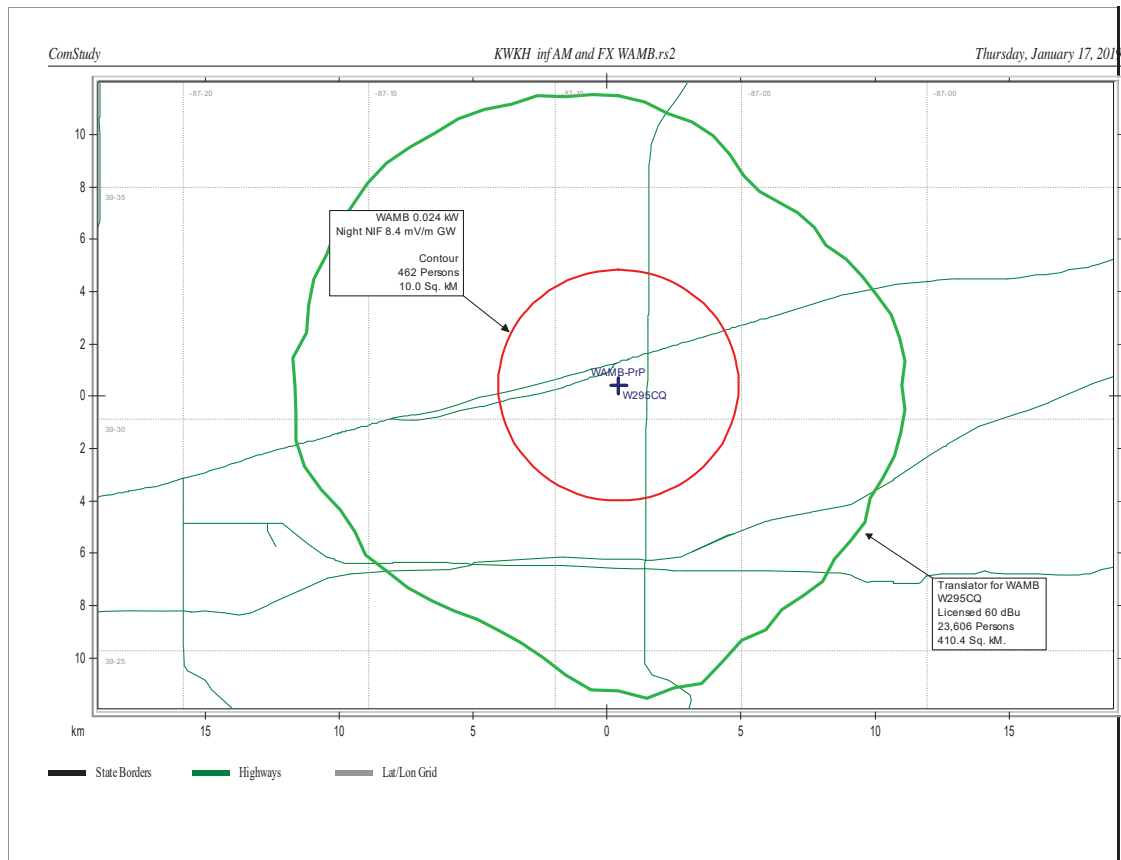


## KTMR



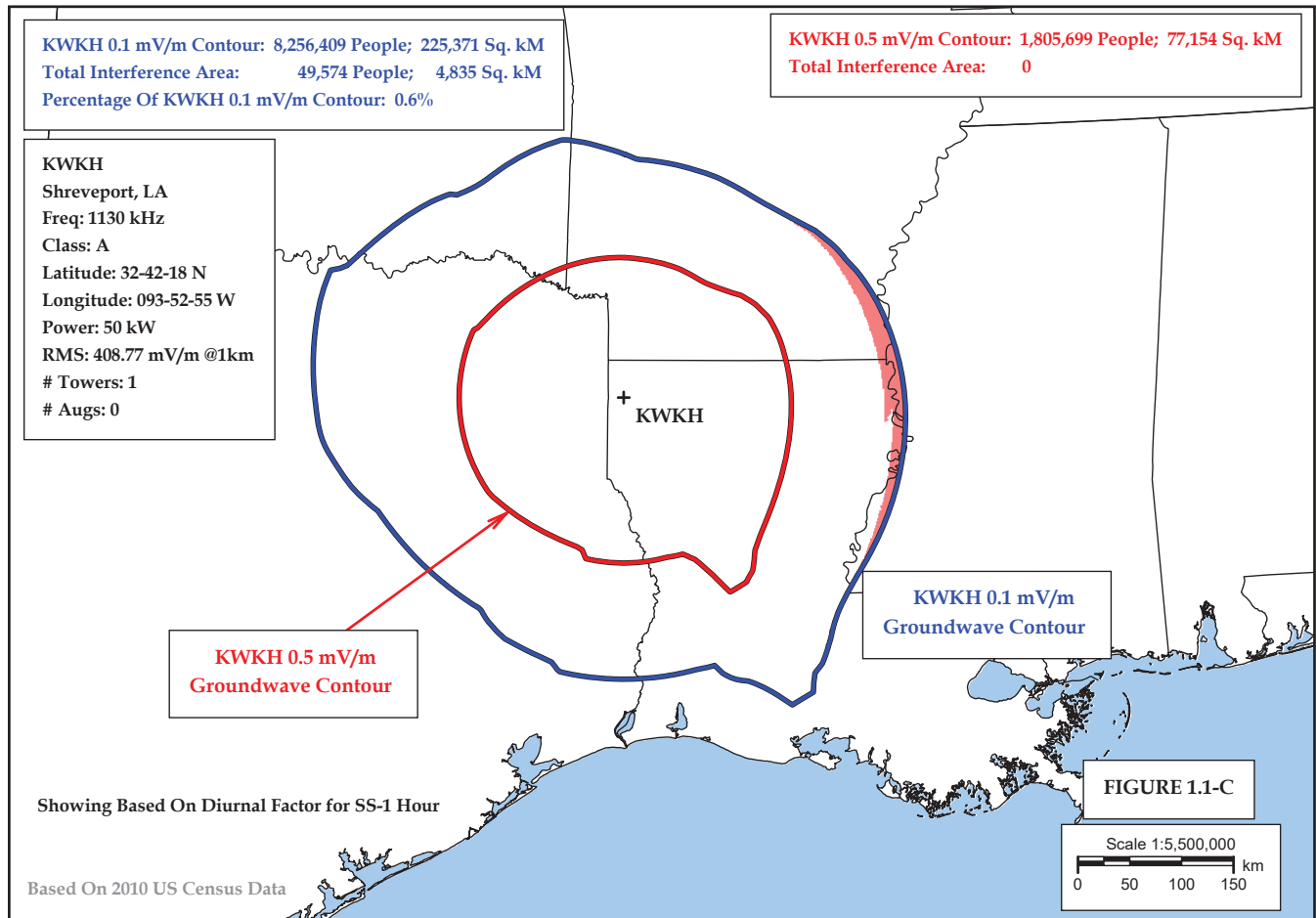


## WAMB

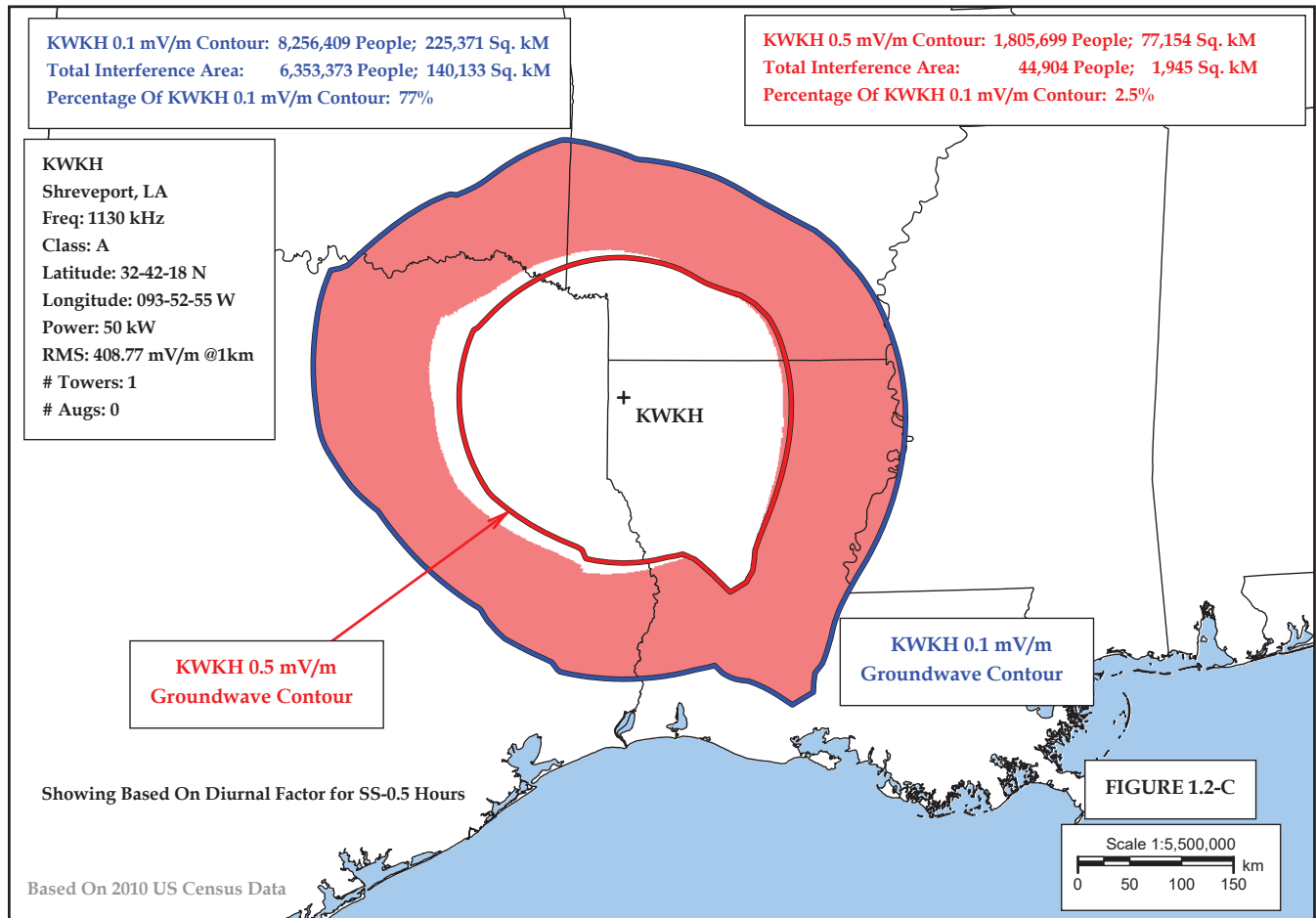


Summary of FM Translator Studies/KWKH

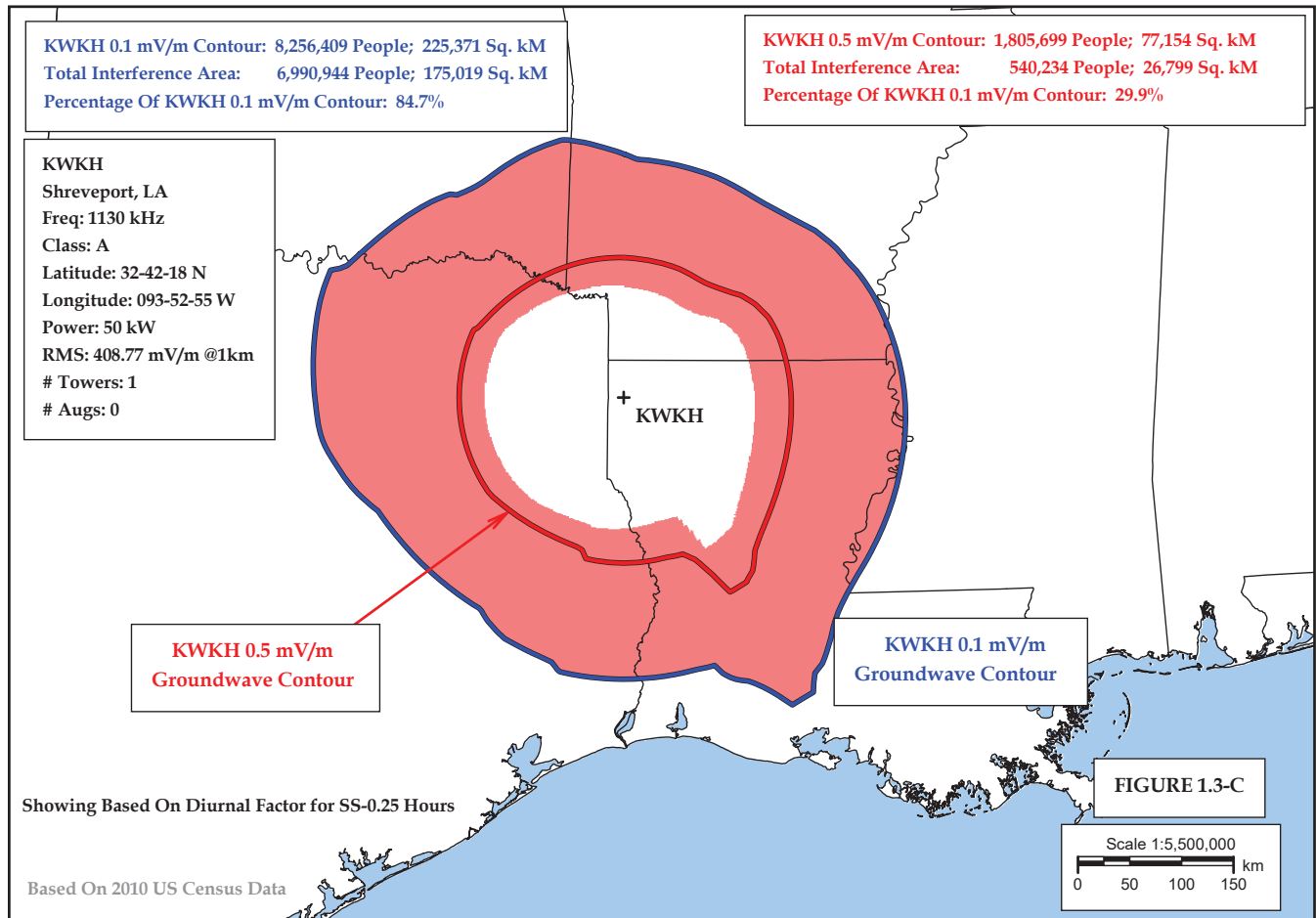
Class D AM Station Causing Interference to Class A Station KWKH if Class D Operates with Maximum Power Per Nighttime Alternative 1	FM Translator (License or Permit) Associated with Class D Station	Population Within FM Translator's 60 dBu Contour	Population Within Class D Station's Potential Nighttime Interference Free Contour Under Nighttime Alternative 1
KLEY	K262CQ	9,384	8,142
KAAB	N/A	N/A	4,149
WLBA	N/A	N/A	10,282
WYXE	N/A	N/A	12,904
WBZB	W283CP	27,936	8,897
WQFX	W254DJ	88,901	388
KILJ	K253CN	12,645	93
WALQ	W257DL	212,550	36
KTMR	K223CT	24,371	0
WAMB	W295CQ	23,606	462
<b>Cumulative Sum:</b>		<b>399,393</b>	<b>45,353</b>



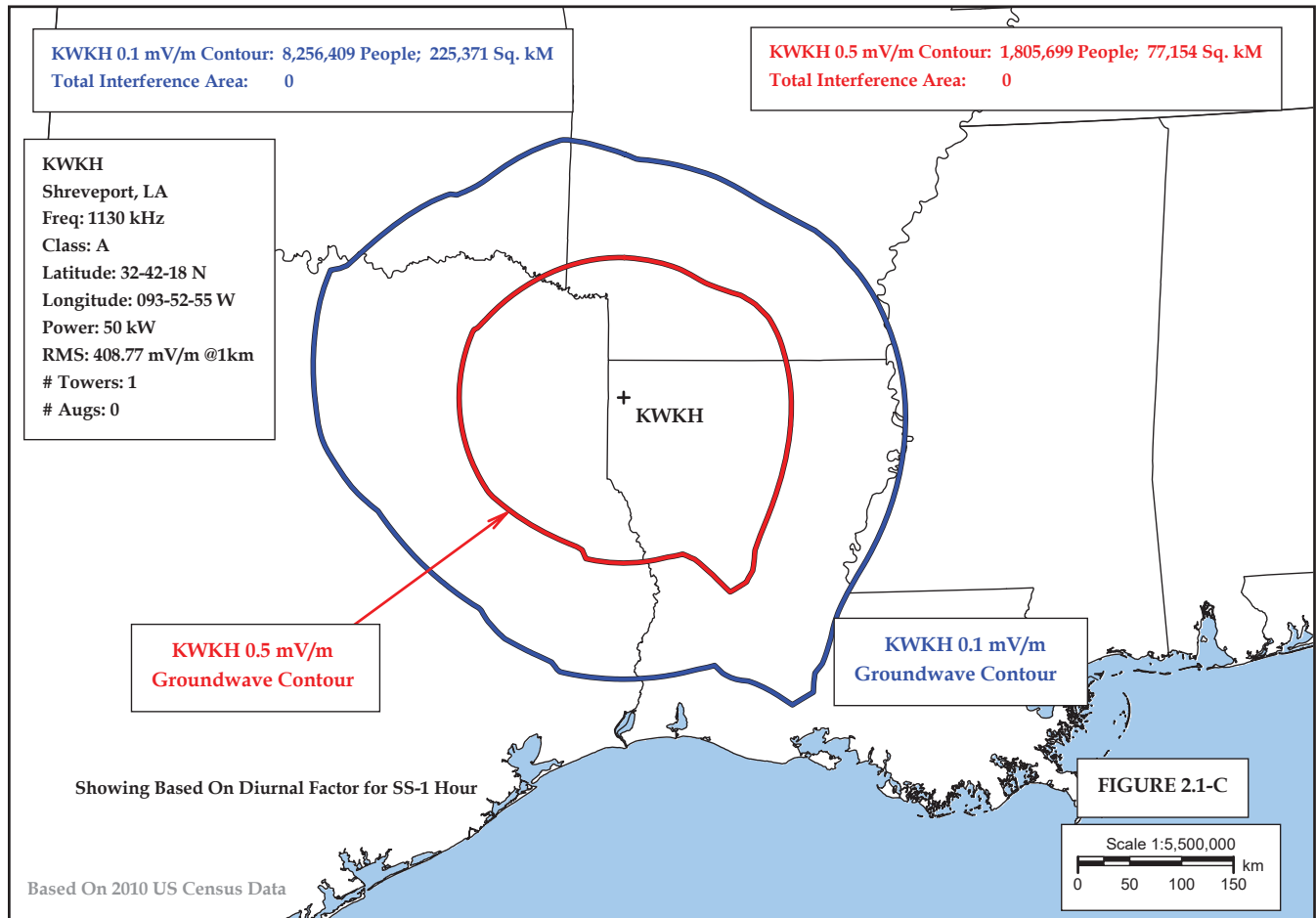
Alternate 1 - Proposed Critical Hours Interference Area to KWKH From The Licensed Daytime Hours Operation Of Stations WLBA, WYXE, WPYB And WALQ To Class A Station KWKH, Shreveport, LA for One Hour Before Sunset



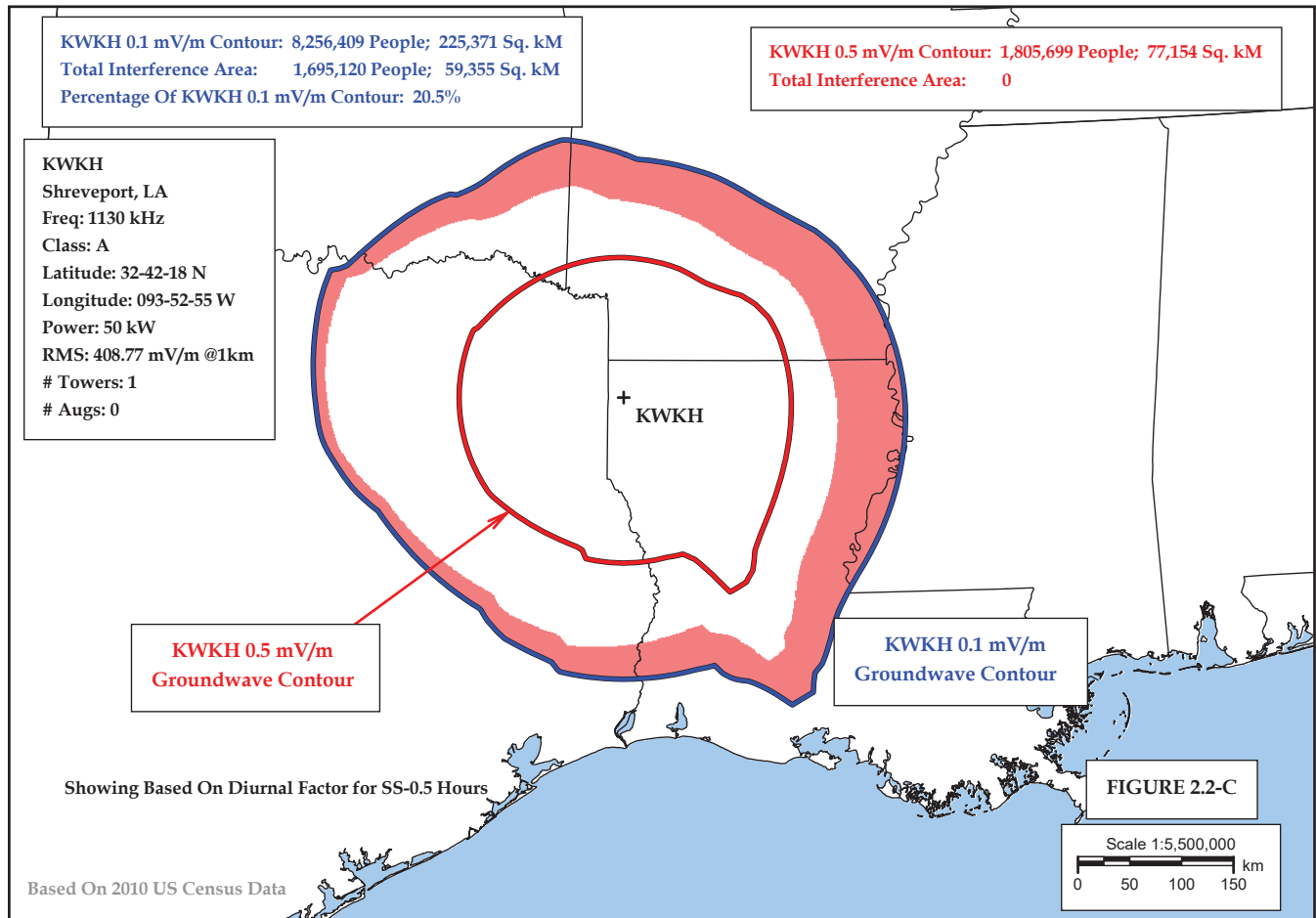
Alternative 1 - Proposed Critical Hours Interference Area to KWKH From The Licensed Daytime Hours Operation Of Stations WLBA, WYXE, WPYB And WALQ To Class A Station KWKH, Shreveport, LA for One-Half Hour Before Sunset



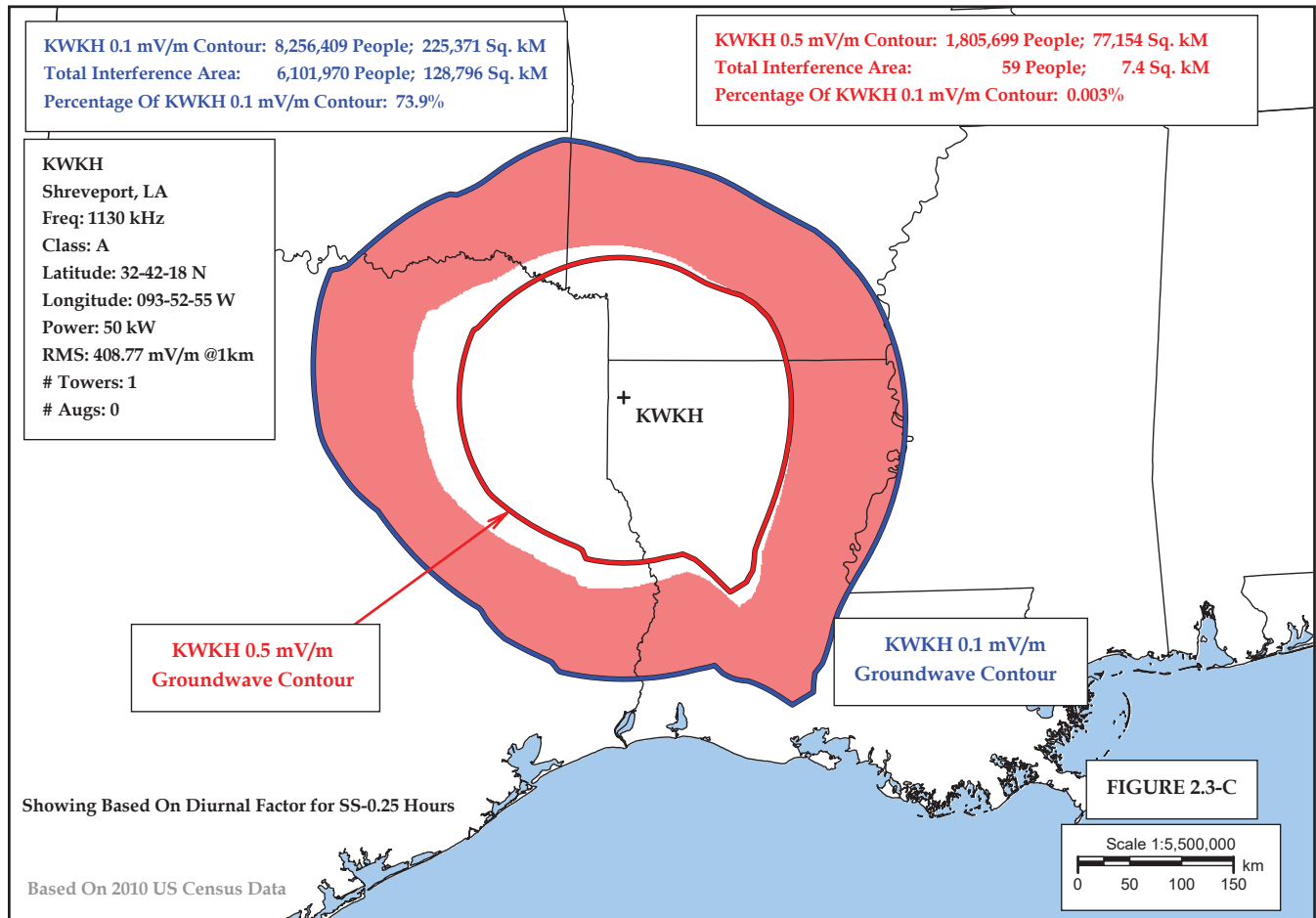
Alternative 1 - Proposed Critical Hours Interference Area to KWKH From The Licensed Daytime Hours Operation Of Stations WLBA, WYXE, WPYB And WALQ To Class A Station KWKH, Shreveport, LA for One-Quarter Hour Before Sunset



Alternative 2 - Proposed Critical Hours Interference Area to KWKH From Potential Critical Hours Operation Of Stations WLBA, WYXE, WPYB And WALQ To Class A Station KWKH, Shreveport, LA for One Hour Before Sunset

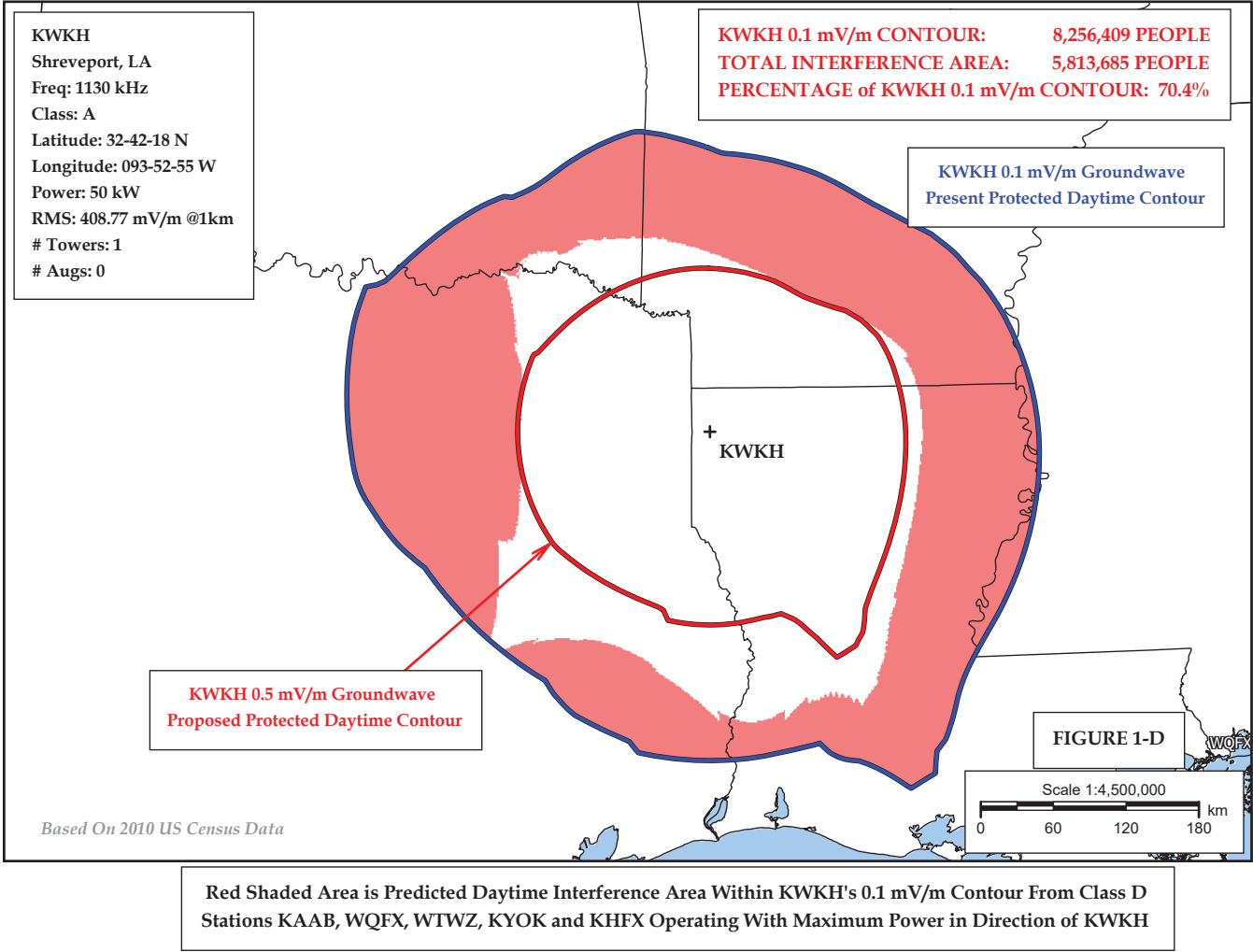


Alternative 2 - Proposed Critical Hours Interference Area to KWKH From Potential Critical Hours Operation Of Stations WLBA, WYXE, WPYB And WALQ To Class A Station KWKH, Shreveport, LA for One-Half Hour Before Sunset



Alternative 2 - Proposed Critical Hours Interference Area to KWKH From Potential Critical Hours Operation Of Stations WLBA, WYXE, WPYB And WALQ To Class A Station KWKH, Shreveport, LA for One-Quarter Hour Before Sunset





KAAB\_D  
Batesville, AR  
Freq: 1130 kHz  
Class: D  
Latitude: 35-44-40 N  
Longitude: 091-38-21 W  
Licensed Power: 1 kW DA  
Potential Power: 10 kW  
In Direction Of KWH 0.5 mV/m  
Groundwave Contour  
RMS: 295.315 mV/m @1km  
# Towers: 1  
# Augs: 0

Potential KAAB Population Gain in the Direction of KWKH Resulting  
From Protecting the Daytime 0.5 mV/m Contour For Class A Station KWKH:  
183,360 People; 4,452 Sq. km.

+ KAAB  
KWKH 0.5 mV/m Groundwave Proposed Protected Contour

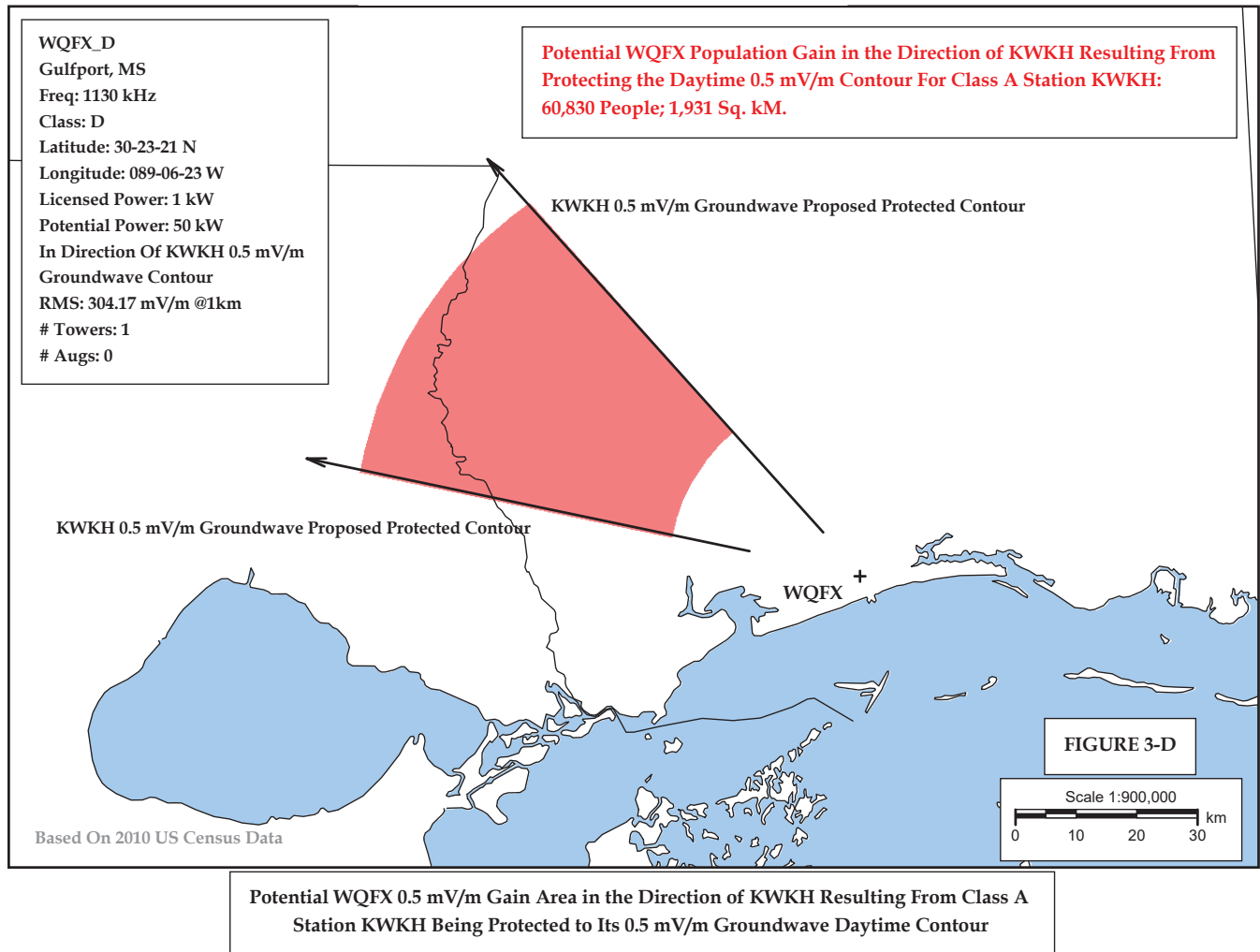
KWKH 0.5 mV/m Groundwave Proposed Protected Contour

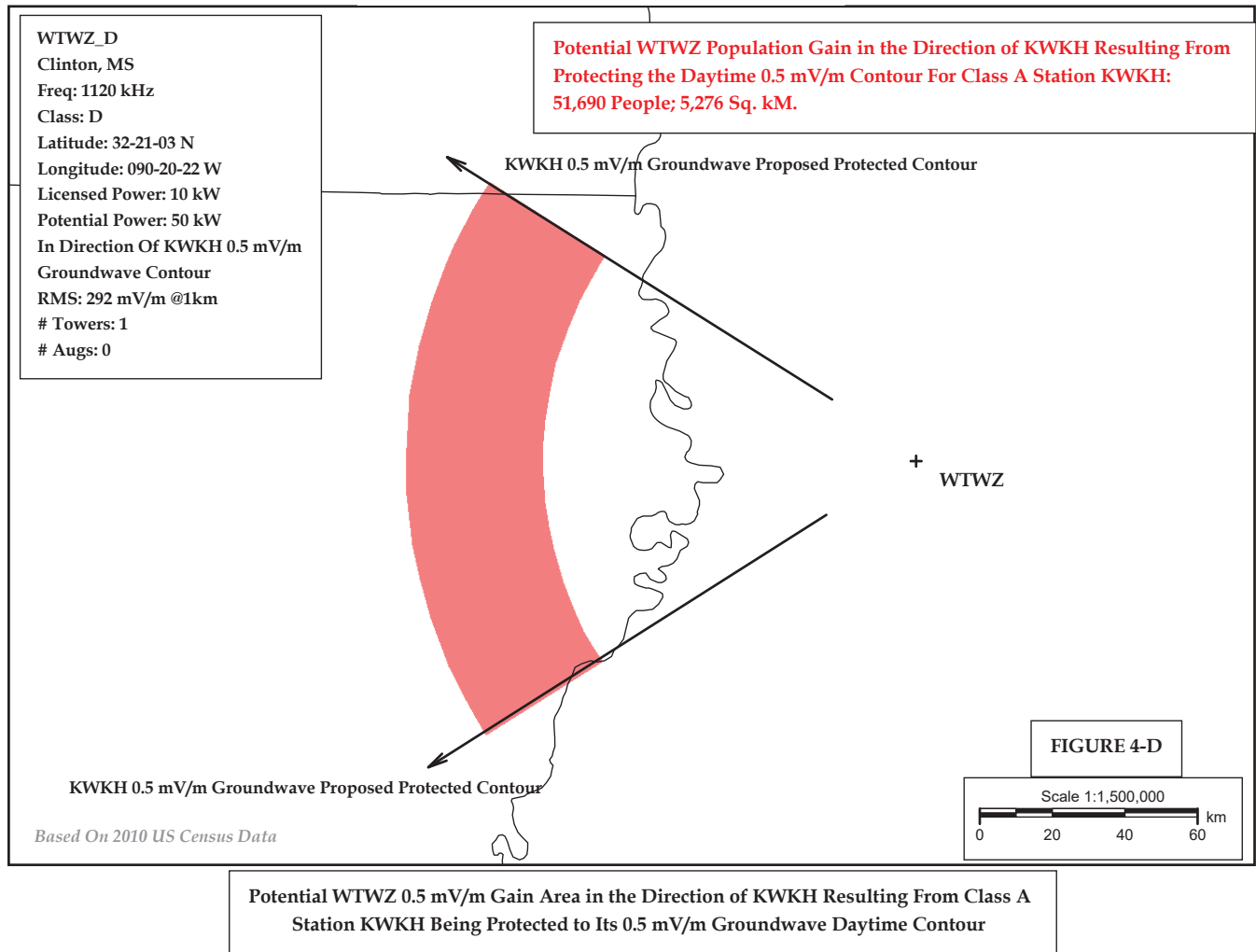
Based On 2010 US Census Data

FIGURE 2-D

Scale 1:1,000,000  
0 10 20 30 km

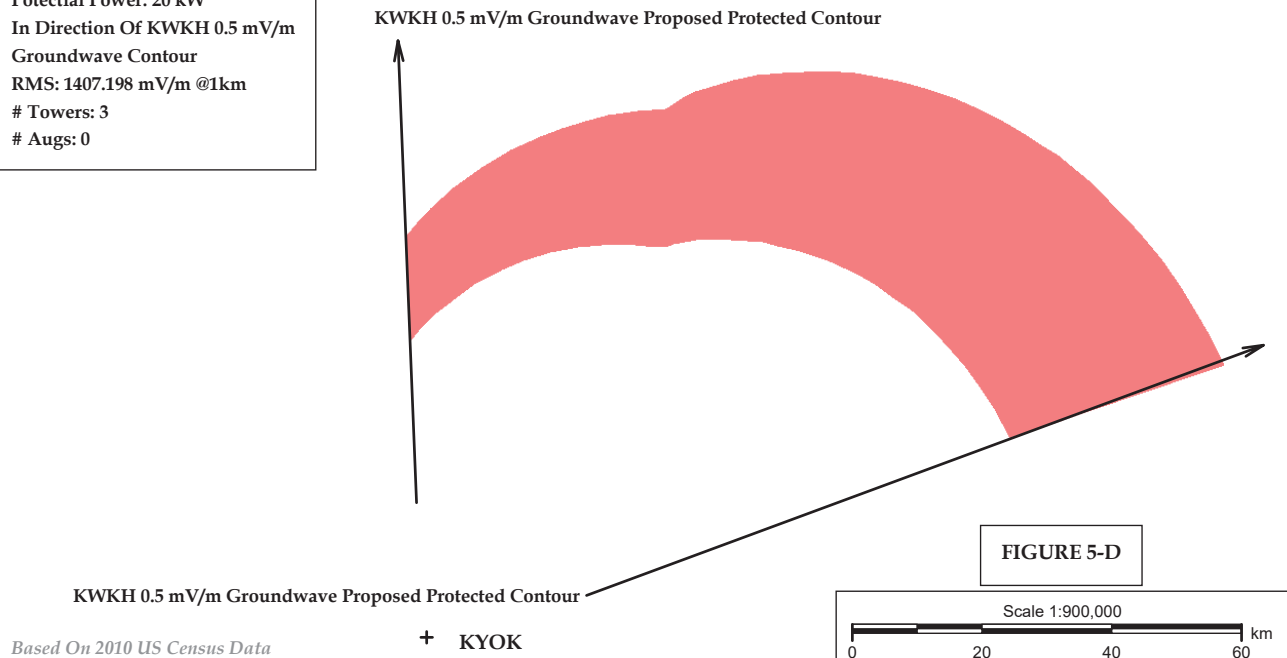
Potential KAAB 0.5 mV/m Gain Area in the Direction of KWKH Resulting From Class A  
Station KWKH Being Protected to Its 0.5 mV/m Groundwave Daytime Contour





KYOK\_D  
Conroe, TX  
Freq: 1140 kHz  
Class: D  
Latitude: 30-20-40 N  
Longitude: 095-27-32 W  
Licensed Power: 5 kW DA  
Potential Power: 20 kW  
In Direction Of KWKH 0.5 mV/m  
Groundwave Contour  
RMS: 1407.198 mV/m @1km  
# Towers: 3  
# Aucs: 0

Potential KYOK Population Gain in the Direction of KWKH Resulting From  
Protecting the Daytime 0.5 mV/m Contour For Class A Station KWKH:  
39,287 People; 3,320 Sq. km.



Potential KYOK 0.5 mV/m Gain Area in the Direction of KWKH Resulting From Class A  
Station KWKH Being Protected to Its 0.5 mV/m Groundwave Daytime Contour

**KWKH, SHREVEPORT, LOUISIANA**  
**1130 kHz 50 kW DA-N**  
**JANUARY 2019**

**KWKH NIGHTTIME OPERATION**

0.5 mV/m 50% Skywave  
(Presently Protected  
Contour)  
Current Population

Interference Caused to 0.5 mV/m 50% Skywave by  
Maximized Class D Nighttime Operations Per *SFNPRM*  
Nighttime Alternative 1  
(Figure 1-N)

	Population:	Percentage of Interference to Population Within 0.5 mV/m 50% Skywave:
32,378,413	1,802,900	5.6%

**GAIN IN CLASS D STATION'S NIGHTTIME INTERFERENCE FREE CONTOUR SERVICE**  
**WITH MAXIMUM POWER IN THE DIRECTION OF KWKH (Figures 2-N through 11-N)**

Maximizing Class D Station	Gain by Population (Persons) and Area (square kilometers)	Figure
KLEY	8,142/217	2-N
KAAB	4,149/90	3-N
WLBA	10,282/47	4-N
WYXE	12,904/40	5-N
WBZB	8,897/21	6-N
WQFX	388/0.2	7-N
KILJ	93/16	8-N
WALQ	36/29	9-N
KTMR	0/0.1	10-N
WAMB	482/10	11-N
<b>COLLECTIVE GAIN:</b>	<b>45,373/460.2</b>	

NET LOSS IN SERVICE FROM *SFNPRM* NIGHTTIME ALTERNATIVE 1 (CLASS A  
AM STATION LOSS MINUS COLLECTIVE GAIN IN CLASS D SERVICE):

1,802,900 (Loss of Class A AM Service) – 45,373 (Collective Class D Gain) = 1,757,527 persons Net  
Loss

KWKH, SHREVEPORT, LOUISIANA

1130 kHz 50 kW DA-N

JANUARY 2019

KWKH CRITICAL HOURS OPERATION

SENPRM Alternative 1: No Critical Hours Protections To Class A AM Stations

Critical Hours Time Period	Interference Caused Within Class A 0.1 mV/m Groundwave Contour By Class D Operations With Full Daytime Power			Interference Caused Within Class A 0.5 mV/m Groundwave Contour By Class D Operations With Full Daytime Power		
	Population:	Area (square kilometers):	Percentage of Interference to Population Within 0.1 mV/m Groundwave Contour:	Population:	Area (square kilometers):	Percentage of Interference to Population Within 0.5 mV/m Groundwave Contour:
One Hour Before Sunset (Figure 1.1-C)	49,574	4,835	0.6%	0	0	0%
One-Half Hour Before Sunset (Figure 1.2-C)	6,353,373	140,133	77%	44,904	1,945	2.5%
One-Quarter Hour Before Sunset (Figure 1.3-C)	6,990,944	175,019	84.7%	540,234	26,799	29.9%



**KWKH CRITICAL HOURS OPERATION**

**SFNPRM Alternative 2: Section 73.190 Critical Hours Figures Revised to Reference Distance From 0.5 mV/m Contour  
(in Lieu of 0.1 mV/m Contour) of Class A AM Stations**

Critical Hours Time Period	Interference Caused Within Class A 0.1 mV/m Groundwave Contour By Class D Operations Per Alternative 2			Interference Caused Within Class A 0.5 mV/m Groundwave Contour By Class D Operations Per Alternative 2		
	Population:	Area (square kilometers):	Percentage of Interference to Population Within 0.1 mV/m Groundwave Contour:	Population:	Area (square kilometers):	Percentage of Interference to Population Within 0.5 mV/m Groundwave Contour:
One Hour Before Sunset (Figure 2.1-C)	0	0	0	0	0	0%
One-Half Hour Before Sunset (Figure 2.2-C)	1,695,120	59,355	20.5%	0	0	0
One-Quarter Hour Before Sunset (Figure 2.3-C)	6,101,970	128,796	73.9%	59	7.4	0.003%

**KWKH, SHREVEPORT, LOUISIANA**  
**1130 kHz 50 kW DA-N**  
**JANUARY 2019**

**KWKH DAYTIME OPERATION**

<b>0.1 mV/m Groundwave (Presently Protected Contour)</b>	<b>Interference Caused to Class A 0.1 mV/m Groundwave Contour By Maximized Class D Daytime Operations Per <i>SFNPRM</i> Daytime Proposal (Figure 1-D)</b>
--	---

<b>Population:</b>	<b>Population:</b>	<b>Percentage of Interference to Population Within 0.1 mV/m Groundwave Contour:</b>
8,256,409	5,813,685	70.4%

**GAIN IN CLASS D STATION'S DAYTIME OPERATION IN THE DIRECTION OF KWKH  
WITH MAXIMUM POWER IN THE DIRECTION OF KWKH (Figures 2-D through 5-D)**

<b>Maximizing Class D Station</b>	<b>Gain by Population (Persons) and Area (square kilometers)</b>	<b>Figure</b>
KAAB	183,360/4,452	2-D
WQFX	60,830/1,931	3-D
WTWZ	51,690/5,276	4-D
KYOK	39,287/3,320	5-D
<b>COLLECTIVE GAIN:</b>	<b>335,167/14,979</b>	

**NET LOSS IN SERVICE FROM *SFNPRM* DAYTIME PROPOSAL (CLASS A AM STATION  
LOSS MINUS COLLECTIVE GAIN IN CLASS D SERVICE):**

**5,813,685 (Loss of Class A AM Service) – 335,167 (Collective Class D Gain) = 5,478,518 persons Net  
Loss<sup>1</sup>**

---

<sup>1</sup> This figure represents the net loss assuming upgrades by the listed neighboring Class D stations. Potentially different populations within the studied Class A AM station could be subject to interference depending upon future neighboring upgrades, with up to 6,450,710 persons subject to loss of service (KWKH's 0.1 mV/m daytime contour population of 8,256,409 minus KWKH's 0.5 mV/m daytime contour population of 1,805,699 = 6,450,710).

# Grid Based Incoming Interference Population Report

## Station Information:

Call: KWKH  
 Freq: 1130 kHz  
 SHREVEPORT, LA, US  
 Hours: N  
 Lat: 32-42-18 N  
 Lng: 093-52-55 W  
 Power: 50.0 kW  
 Theo RMS: 2838.88 mV/m @ 1km @ 50.0 kW  
 # of Augmentations: 27

#	Field Ratio	Phase (deg)	Spacing (deg)	Orient (deg)	Height (deg)	Ref Switch	TL Switch	A (deg)	B (deg)	C (deg)	D (deg)
1	1.000	95.5	0.0	0.0	198.0	0	0	0.0	0.0	0.0	0.0
2	1.950	0.0	115.3	205.0	198.0	0	0	0.0	0.0	0.0	0.0
3	1.000	-95.5	230.6	205.0	184.0	0	0	0.0	0.0	0.0	0.0

#	Azimuth (deg)	Radiation (mV/m@1km)	Span (deg)
1	.00	334.74	10.0
2	5.00	301.75	10.0
3	10.00	269.57	10.0
4	45.00	138.40	10.0
5	50.00	160.93	20.0
6	55.00	126.33	10.0
7	60.00	160.93	20.0
8	70.00	160.93	10.0
9	76.50	325.00	10.0
10	80.00	177.03	20.0
11	110.00	1910.29	10.0
12	115.00	2188.71	10.0
13	190.00	4609.16	20.0
14	200.00	4816.77	40.0
15	220.00	4836.08	40.0
16	240.00	4863.44	40.0
17	292.50	2333.55	25.0
18	312.00	769.27	20.0
19	316.00	559.73	14.0
20	320.00	366.29	16.0
21	325.00	402.34	12.0
22	330.00	437.74	10.0
23	335.00	453.84	10.0
24	340.00	469.93	10.0
25	345.00	494.07	10.0
26	350.00	502.12	10.0
27	355.00	479.58	10.0

-----

Theoretical RMS: 2838.88 mV/m@1km Erss = 2699.59 mV/m@1km  
Standard RMS: 2981.75 mV/m@1km Q = 70.71 mV/m@1km  
Augmented RMS: 3060.99 mV/m@1km

Study Information:

Calculation Area: SkyWave 500.0 uV/m  
Grid Size: 500 x 500  
Reference Propagation Model: Groundwave + Skywave  
Interference Propagation Model: Groundwave + Skywave  
Ratios:  
    Co-channel: 20.0  
    First Adjacent: 2.0  
    Second Adjacent: 0.033  
    Third Adjacent: 0.033  
Ix signals combined using RSS methodology: Yes  
    RSS Cutoff Percentage: 50.0  
Threshold for reception: 0.1 mV/m  
Population Database: 2010 US Census (PL)

Summary:

Total Station Coverage: 32,378,413 ( 4140429.8 sq. km )  
Total Interference: 1,802,900 ( 108274.7 sq. km )  
Interference Free Coverage: 30,575,513 ( 4032144.3 sq. km )

Stations Causing Interference:

Call Letters	Area (sq. km)	Housing Units	Population
KTMR_N	7,676	269,495	687,894
KAAB_N	20,852	308,200	651,398
WALQ_N	37,177	283,433	597,972
WLBA_N	28,029	282,514	597,718
KLEY_N	28,682	133,417	306,204
WQFX_N	53,648	100,340	214,115
KILJ_N	2,453	20,630	44,922
WYXE_N	3,467	12,638	28,441
WBZB_N	1,037	4,568	10,510
WAMB_N	1,045	2,707	5,288

Interference Free Breakdown:

White: 14,826,891 [ 48.5% ]  
Black: 4,497,711 [ 14.7% ]  
Hispanic: 9,614,206 [ 31.4% ]

# Grid Based Incoming Interference Population Report

## Station Information:

Call: KWKH  
Freq: 1130 kHz  
SHREVEPORT, LA, US  
Hours: D  
Lat: 32-42-18 N  
Lng: 093-52-55 W  
Power: 50.0 kW  
Theo RMS: 408.77 mV/m @ 1km @ 1kW

#	Field Ratio	Phase (deg)	Spacing (deg)	Orient (deg)	Height (deg)	Ref Swch	TL Swch	A (deg)	B (deg)	C (deg)	D (deg)
1	1.000	0.0	0.0	0.0	198.0	0	0	0.0	0.0	0.0	0.0

## Study Information:

Calculation Area: GW 0.1 mV/m  
Grid Size: 500 x 500  
Reference Propagation Model: Groundwave  
Interference Propagation Model: Groundwave  
Ratios:  
    Co-channel: 20.0  
    First Adjacent: 1.0  
    Second Adjacent: 0.033  
    Third Adjacent: 0.033  
Ix signals combined using RSS methodology: Yes  
    RSS Cutoff Percentage: 50.0  
Threshold for reception: 0.1 mV/m  
Population Database: 2010 US Census (PL)

## Summary:

Total Station Coverage: 8,256,409 ( 225371.1 sq. km )  
Total Interference: 5,813,685 ( 115753.4 sq. km )  
Interference Free Coverage: 2,442,724 ( 109619.0 sq. km )

## Stations Causing Interference:

Call Letters	Area (sq. km)	Housing Units	Population
KHFX	37,661	1,855,695	4,657,148
WQFX_D	23,862	256,110	597,019
KAAB_D	41,020	191,741	403,755
WTWZ_D	21,930	103,098	229,784

KYOK	11,342	68,033	140,939
KLEY_N	(Not Considered	In Report)	
KAAB_N	(Not Considered	In Report)	
WLBA_N	(Not Considered	In Report)	
WYXE_N	(Not Considered	In Report)	
WBZB_N	(Not Considered	In Report)	
WQFX_N	(Not Considered	In Report)	
KILJ_N	(Not Considered	In Report)	
WALQ_N	(Not Considered	In Report)	
KTMR_N	(Not Considered	In Report)	
WAMB_N	(Not Considered	In Report)	
KAAB	(Not Considered	In Report)	
WQFX	(Not Considered	In Report)	
KTMR	(Not Considered	In Report)	
WTWZ	(Not Considered	In Report)	

-----

Interference Free Breakdown:

White:	1,541,303	[ 63.1% ]
Black:	617,085	[ 25.3% ]
Hispanic:	208,679	[ 8.5% ]
Native American:	18,200	[ 0.7% ]
Asian:	19,801	[ 0.8% ]
Pacific Islander:	1,038	[ 0.0% ]
Mixed Race:	34,464	[ 1.4% ]
Other:	2,154	[ 0.1% ]

Total: 2,442,724

-----

	Housing Units	Population	%
Arkansas			
Ashley County			
Total	10,137	21,853	
KWKH Coverage	10,137	21,853	
Ix Free Cov	0	0	0.00
KAAB_D	10,137	21,853	100.00
WTWZ_D	9,972	21,621	98.94
Bradley County			
Total	5,860	11,508	
KWKH Coverage	5,860	11,508	
Ix Free Cov	171	137	1.19
KAAB_D	5,689	11,371	98.81
WTWZ_D	61	50	0.43
Calhoun County			
Total	2,897	5,368	
KWKH Coverage	2,897	5,368	
Ix Free Cov	741	1,175	21.89
KAAB_D	2,156	4,193	78.11
Chicot County			
Total	5,421	11,800	